Ethical considerations regarding the impact of the Voluntary Carbon Market on smallholder farmers in the Global South

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Abstract

Increasing greenhouse gases (GHG) in the atmosphere alongside the growing visibility of climate change impacts has led to a shift in society's perception and put businesses under pressure to reduce their emissions. The Voluntary Carbon Market (VCM) has proven to be a useful tool in this process, enabling companies to purchase carbon credits generated through emission mitigation activities. Such an activity can be agroforestry, allowing farmers to sequester carbon by integrating trees in agricultural practices on their farms. In return, farmers receive financial compensation through the sale of carbon credits.

This thesis aims to identify and examine the impact of the VCM on the participating smallholder farmers and evaluate whether these impacts are ethically justifiable or not, which forms the central research question. The relevance of this study lies in the growing importance of offset strategies in businesses' climate strategies. As more companies rely on offsetting to achieve their sustainability targets, the rights and well-being of the smallholder farmers who supply these credits should be paid attention to.

To gain an in-depth understanding of the VCM's impact on smallholder farmers, this thesis uses a qualitative research approach that combines a literature review, semi-structured interviews, and a document analysis of VCM project documents. While the existing literature provides a comprehensive overview of the dynamics of the VCM and some critical reflection on possible positive and negative impacts, it fails to address practical issues. This study revealed that improper implementation of agroforestry systems and the lack of information increase farmers' vulnerability and dependency on project developers.

Using Mepham's matrix as a conceptual framework, this thesis conducts an ethical analysis of the findings, which highlights the existence of climate colonialist practices within the VCM. To change those dynamics, the standards of the VCM need to be reviewed and follow a more farmer-led approach to ensure the sustainable well-being of the most vulnerable actors in the system.

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List of Abbreviations

CRUs	Carbon Removal Units
CSA	Climate Smart Agriculture
FPIC	Free, Prior, and Informed Consent
GHG	Green House Gases
ICVCM	Integrity Council for the Voluntary Carbon Market
NGO	Non-Governmental Organization
SDG	Sustainable Development Goal
VCM	Voluntary Carbon Market

1 Introduction

1.1 Background

Greenhouse gases (GHG) in the atmosphere have increased since 1750, and their connection to human activities can no longer be denied. Scientific studies show "that human influence has warmed the atmosphere, ocean and land" (IPCC, 2021, p. 4), causing significant changes in climate and living conditions for humanity. This growing climate crisis generated a shift in societal values. Rattalino (2018) notes that consumers are increasingly aware of the environmental impact of the products they consume and expect companies to adopt sustainable practices and contribute meaningfully to climate change mitigation. Such a shift increases the pressure on companies to implement sustainable strategies, such as striving for net zero.

In previous years, the Voluntary Carbon Market (VCM) has proven to be a helpful approach for businesses to offset their CO_2 emissions, enabling them to state lower emission practices or even carbon neutrality and thus fulfilling societal expectations. The market enables offsetting by trading the emitted carbon for carbon credits. These credits represent carbon sequestration or avoidance efforts carried out through mitigation projects, Streck et al. (2021) explain. In 2021, the VCM reached a transaction value of 2 billion USD (Forest Trends' Ecosystem Marketplace, 2023), which is expected to go up to 50 billion USD by 2030. The main cause of the significant growth is the change in consumer values, a desired decrease in the environmental impact from businesses and individuals, and required GHG reductions (Streck et al., 2021).

Carbon sequestration practices, including agroforestry, which are frequently utilized by smallholder farmers in the Global South, are an essential part of the VCM. These farmers are critical to the production of Carbon Removal Units (CRUs), the marketable product in the VCM, as well as to preserving global food security (Streck et al., 2021; Taherzadeh & Mogollón, 2024). The development and anticipated expansion of the VCM emphasizes the significance of further research into its effects on its members. Despite their crucial

role, the effects of VCM involvement on smallholder farmers have not been sufficiently examined, particularly from an ethical standpoint.

1.2 Problem Statement

According to Kibe et al. (2024) and Tumushabe et al. (2023) the main reason for farmers to join VCM projects is the monetary incentive, an additional income they receive for sequestering carbon. Implementing agroforestry as a sequestration method holds several additional benefits, like access to education, climate change resilience, and improved soil and crop health.

However, studies highlighted a set of risks and challenges associated with such participation in the VCM that have been given little attention in research so far, including limited power in negotiations, lack of information, and a lack of autonomy in decision-making. FPP (2023) emphasizes that smallholder farmers often lack sufficient consideration and are in a vulnerable position, given their circumstances, unable to stand up for their rights. Wang (2021) characterizes carbon offset as “a new form of neocolonialism – climate colonialism” (Wang, 2021, p. 1), where developed countries continue to emit GHG and place their responsibility to the Global South through financial compensation. This action can cause economic dependencies and power imbalances, which raise ethical concerns that need to be investigated.

A clear research gap is addressed by ethically examining the implications of the VCM on smallholder farmers. While existing literature covers the economic potential of the market, little attention has been given to an ethical justification of the impact that smallholder farmers are facing. By applying established ethical theories, this thesis is contributing to the field of environmental ethics and the understanding of the impact of the VCM.

The societal and practical relevance of this study lies in the increasing role of offset strategies in the climate strategies of businesses. As more companies rely on offsetting to achieve their sustainability targets, the rights and well-being of the smallholder farmers who supply these credits should be paid attention to. Smallholder farmers are a key actor of the VCM and enable the supply of carbon credits, simultaneously being its

most vulnerable stakeholder. Understanding the actual impacts of their participation is critical to making the VCM more sustainable and equitable. This thesis promotes ethical practices within the VCM that protect the rights and well-being of smallholder farmers and provides insights for policymakers, carbon project developers, and non-governmental organizations (NGOs).

1.3 Aims and Objectives

This thesis looks at the impacts of the VCM on smallholder farmers participating in carbon projects utilizing agroforestry as a carbon sequestration method. By doing so, it aims to ethically examine the identified impacts and to assess whether the impact on these farmers is ethically justifiable. Through the research, a contribution to more sustainable and ethical practices within the VCM is intended to be achieved. To fulfil these aims, the following objectives have been identified:

1. Identify and analyze the impacts of the VCM on participating smallholder farmers, considering negative and positive aspects.
2. Assess the rights of smallholder farmers participating in carbon projects, including their access to information, decision-making power, and autonomy.
3. Apply ethical theories to evaluate whether the impacts and rights are ethically justifiable.
4. Highlight the social relevance of carbon offsetting practices by emphasizing smallholder farmers as key stakeholder in the VCM.
5. Contribute to the academic field by addressing a research gap in the literature on ethical considerations of the VCM's impacts on smallholder farmers in the Global South.

1.4 Research Questions

To guide the research and achieve the aims and objectives outlined above, three research questions are central to this study:

I. What are the (direct) impacts of the VCM on smallholder farmers in the Global South?

II. What rights do smallholder farmers participating in the VCM hold?
III. Is the impact of the VCM on smallholder farmers ethically justifiable?

Each question will be addressed through a combination of interviews and document analysis and interpreted using ethical theories.

1.5 Structure of the Thesis

This thesis is structured into six chapters, each contributing to a comprehensive ethical analysis of the implications faced by smallholder farmers' participation in carbon projects. Chapter 2 Theory and Conceptual Framework provides the theoretical foundation of the thesis by explaining key concepts related to the VCM, smallholder farmers, and ethical theories. Resulting in a conceptual framework as a tool to study smallholder farmers' involvement in VCM projects, for which documents were analyzed and interviews conducted. Chapter 3 Research Methodology outlines the research approach, including the research design, data collection (interviews and document analysis), analytical methodology, and the study's limitations. In Chapter 4 Results, the main findings of the empirical research are presented, showing the data collected through document analysis and stakeholder interviews. Chapter 5 Discussion provides a critical discussion of these findings by comparing them to the theoretical insights presented in Chapter 2 and applying the conceptual framework. Chapter 6 Conclusion provides a recap of the thesis, answers the research questions, offers practical recommendations for VCM actors, reflects on the study's limitations, and gives recommendations for further research.

2 Theory and Conceptual Framework

2.1 The Voluntary Carbon Market

Streck et al. (2021) described the VCM as a market where private individuals, businesses, and other actors can purchase carbon credits, in addition to the obligatory emission regulations. Defined is the Voluntary Carbon Market (VCM) by Dawes et al. (2023) as

"marketplaces or market initiatives with some defined rules and regulations that guide the supply of carbon credits or demand for/use of these credits" (p. 2).

Participants voluntarily invest in projects that remove greenhouse gases (GHG) from the atmosphere and receive carbon credits in return. These credits can be used to offset emissions, allowing buyers to claim a smaller carbon footprint. The theoretical discussions of carbon offset also reference related terms such as emission trading schemes, emission trading, as well as tradable permits, and cap-and-trade (Rudolph & Aydos, 2021).

In addition to the VCM, the compliance carbon market exists to fulfil legally binding emissions reduction targets set by regional, national, and international agreements, such as the 1997 Kyoto Protocol and the 2015 Paris Agreement. Compliance markets, compared to the VCM, is more structured and regulated, as Dawes et al. (2023) and Kreibich (2024) states.

This study focuses on the VCM, examining its impact on smallholder farmers ethically. Therefore, the compliance market is not considered in the analysis due to its fundamentally different structure, regulatory framework, and stakeholder involvement. Specifically, the compliance market functions under legally required frameworks that limit the participation of smallholder farmers, whereas the VCM involves voluntary participation, often targeting farmers in the Global South through offset initiatives like agroforestry or regenerative agriculture (Ansah et al., 2020).

The goal of the VCM is to enable its participants to support climate mitigation activities while voluntarily offsetting their emissions. By doing so, companies can pursue their climate targets, improve their public image, and financially support projects that

contribute to sustainable practices. The market was developed independently by companies and individuals with the motivation to reduce their carbon footprint (Bellassen & Leguet, 2007).

Key players on the supply side of the VCM are the sellers of carbon credits, which include project owners and project developers of various carbon offset initiatives. These projects focus on GHG reduction activities across a range of sectors, including agriculture, chemical process/industrial manufacturing, energy efficiency, household/community devices, forestry and land use, renewable energy, transportation, and waste management (Forest Trends' Ecosystem Marketplace, 2024; ICR, 2025; Streck et al., 2021). Sellers of carbon credits can be companies, financial institutions, NGOs, or individuals involved in the development and management of carbon offset projects. Since this thesis focuses specifically on smallholder farmers, only projects including agricultural practices as mitigation activities will be considered.

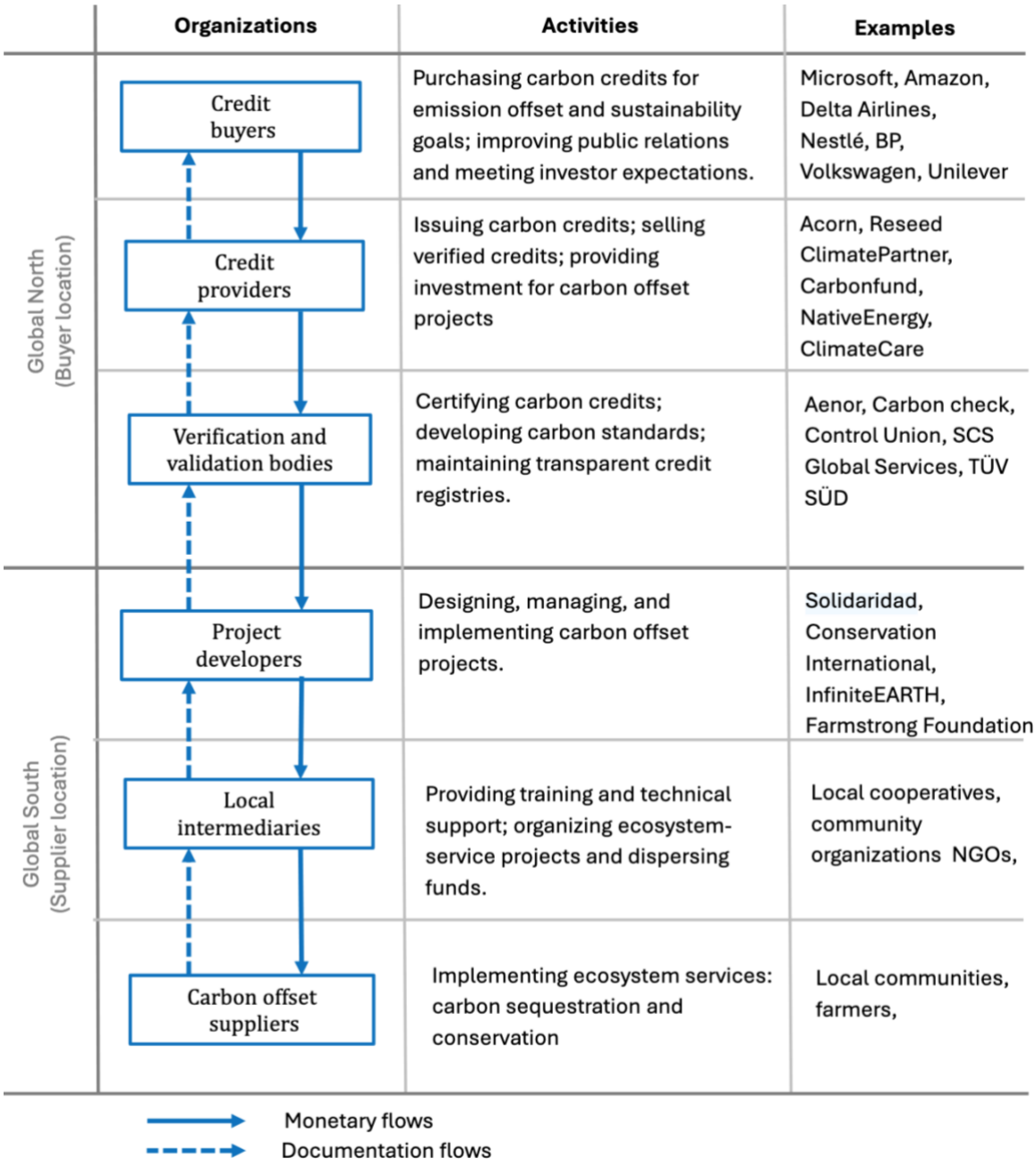
Via local intermediaries, the project developers come in contact with the carbon offset supplier, such as the farmers, who carry out the climate mitigation activity, as FSD (2025) described. Their role in the VCM will be explored in more detail in the following sections.

On the demand side, buyers of carbon credits produced in the VCM include public and private actors: governments, NGOs, and primarily businesses that view the market as an opportunity to reduce their emissions and improve their sustainability credentials. As society and government continue to increase the pressure on companies to cut their impact on the planet, the VCM serves as a decarbonization tool, helping enterprises to reduce their emission and, in some cases, claim net-zero (FSD, 2025).

Another important group of stakeholders includes certifiers and standards-setting bodies, which help regulate the VCM. While ISDA (2021) describes the VCM as a not very regulated market, there are certain regulations and verification steps that participants need to apply before being able to sell carbon credits. Carbon standards that define criteria for projects to ensure the credit's quality, transparency, and accountability are set by private organizations. Widely used standards are the Verified Carbon Standard (VCS), the Gold Standard, the Climate Action Reserve, and the American Carbon Registry (FSD, 2025; Streck et al., 2021). Furthermore, the Integrity Council for the Voluntary

Carbon Market (ICVCM) was established to ensure the integrity and credibility of carbon offsetting within the VCM (FSD, 2025). The interaction between the actors and their activities is shown in Figure 1.

Figure 1 – Key Players and Activities in the VCM



Note: The Figure by FSD (2025, p. 21) shows a simplified order of actors in the VCM

2.2 Smallholder Farmers and their Participation in the VCM

There is no dominant definition of smallholder farmers being used in the academic literature; nevertheless, several definitions are presented by Khalil et al. (2017). For this thesis, and in alignment with the definitions outlined by Khalil et al. (2017), smallholder farmers are considered

> *"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, p. 5).

Smallholder farmers participating in the VCM through carbon offset projects that focus on land-based activities, such as reforestation and climate-smart agriculture (CSA), including agroforestry and soil sequestration (Kibe et al., 2024; Kreibich, 2024). Agroforestry, as a typical carbon sequestrating practice in VCM projects, incorporates trees into the agricultural fields and provides shade for the crops while sequestrating carbon from the atmosphere. Whereas one metric ton of carbon removed from the atmosphere equals one Carbon Removal Unit (CRU). The project developer is responsible for issuing these CRUs, which are then sold as carbon credits to companies or other purchasers who want to offset their emissions. In return for the sequestration efforts, smallholder farmers receive financial compensation, technical support, and access to new markets (FSD, 2025).

Smallholder farmers themselves can additionally implement further mitigation activities which aren't financially compensated but only for the purpose of reducing their own GHG emissions (FSD, 2025; PUR, 2023).

2.2.1 Benefits for Smallholder Farmers in the VCM

VCM project developers initiate agroforestry projects, aiming to increase the implementation of agroforestry practices on farms. Smallholder farmers can become involved in these projects and plant trees on their farms, for which they receive payments based on the amount of carbon sequestered and gain access to the VCM. While financial

compensation is the main incentive, helping farmers to increase financial stability and resilience with the additional income, there are several non-fiscal benefits (FSD, 2025).

As highlighted by Kibe et al. (2024) and Tumushabe et al. (2023), carbon credit initiatives can bring a lot of benefits not only for participating farmers but also for the wider community. These include environmental, economic, and social factors which help in the preservation of natural resources. Involvement in a VCM project can provide access to training and education for sustainable agricultural practices, as well as technical support.

Agroforestry itself generates some direct benefits to farmers and their fields, including resilience to climate change and sustainable livelihood, increased soil health, a better water cycle on the farm, and higher crop yields. Those benefits are valuable side effects of implementing agroforestry practices. Financial compensation, however, is only received for the sequestered carbon by the planted trees (FSD, 2025; Kibe et al., 2024; Tumushabe et al., 2023).

2.2.2 Challenges for Smallholder Farmers in the VCM

While participation in the VCM offers potential benefits, Barbato & Strong (2023) and Tumushabe et al. (2023) emphasize that smallholder farmers face numerous challenges. Many express dissatisfactions with the financial returns, which are often viewed as insufficient to compensate for the required effort. The administrative workload is another significant hurdle, as the process demands extensive paperwork and lacks consistency and clarity. The methodology behind credit calculations is often unclear, creating confusion. Additionally, the system appears to disproportionately benefit large-scale landowners, leaving smallholder farmers at a disadvantage.

Most carbon credits are created in the Global South (Streck et al., 2021), and Wang (2021) notes that tree-plating initiatives in developing countries to offset emissions of developed countries can lead to a new form of neocolonialism. This refers to the use of economic influence, globalization, and cultural dominance. Táíwò (2019) defines this dynamic as climate colonialism, where richer countries exploit power imbalances to dominate underdeveloped countries and their smallholder farmers. Such dominance can influence

the development of the Global South in their interest, limiting space for housing and farming land for their people (Wang, 2021). Shiva (2000) (as cited in Hourdequin, 2024) points out the development of increased dependencies with the modernization, industrialization, and market integration of smallholder farmers.

The literature further emphasizes that insufficient consideration of smallholder farmers' rights further intensifies these issues. Communities are frequently excluded from negotiations or lack representation in decision-making processes about carbon projects on their lands. Without frameworks ensuring equitable participation and fair compensation, carbon offset initiatives risk becoming exploitative rather than fostering smallholder farmers' development (FPP, 2023).

Furthermore, FSD (2025) highlights challenges in governance, transparency, and fairness, specifically regarding the distribution of payments. Narloch et al. (2013) describe some projects prioritize cost-efficiency over fairness, while voluntary carbon standards often emphasize emission reduction at the expense of socio-economic concerns (Pan et al., 2022). Despite initiatives like Gold Standards "fair carbon" concept, which emphasizes fairness and equity in the distribution of benefits, significant challenges remain. These include involving communities and farmers in project decision-making and addressing power imbalances that can marginalize participants (Howard et al., 2015, as cited in FSD, 2025).

2.3 An Introduction to Ethics

The study of ethics looks at standards that humans should follow, as well as the norms of behavior that individuals stick to, whether intentionally or unintentionally. With ethical concepts, the question of what is morally right or wrong can be approached, and several philosophers have proposed many methodologies for solving ethical problems, offering to look at situations from different perspectives (Mizzoni, 2017).

Ethics is the "philosophical study of morality" (Deigh, 2010, p. 7) while the word morality is used synonymously for ethics, and to fully understand its scope, morality needs to be discussed first. Deigh (2010) differentiates between two types of morality: conventional and universal morality. Conventional morality focuses on the moral beliefs and practices

of a specific society, describing what its members perceive as right or wrong. For instance, someone was raised to believe interracial relationships are wrong because that's the perception of their community. Later, they find a friendship that challenges that belief (Deigh, 2010).

Alternatively, universal morality is grounded in reason and aims to apply principles to everyone regardless of place and time, which is not about personal beliefs but what is truly right or wrong. Deigh (2010), for instance, describes a list of universal norms such as "tell the truth", "Keep your promise" or "Don't steal" (p. 11).

Both theories hold that People can challenge society's norms, suggesting that there are moral practices that go beyond what is commonly accepted. Reason and autonomous ideals, not only traditions, should be the source of true moral principles. These criteria have a separate and more legitimate basis, even though they can overlap with social norms. Morality involves identifying its standards, organizing them systematically, and explaining the logical basis for its authority in practical decision-making. This is what differentiates ethics from other social studies like sociology and anthropology, which describe, analyze, and explain how societies think about morality but don't conclude what a person ought to do (Deigh, 2010).

As a practical discipline, ethics examines the distinction between good and bad life goals, as well as right and wrong actions in human conduct (Chambers, 2011; Deigh, 2010). Its primary aim is to determine the principles guiding "how one ought to live and what actions one ought to do in the conduct of one's life" (Deigh, 2010, p. 7). Additionally, ethics seeks to identify moral principles that hold universal applicability. Unlike other social sciences, which primarily describe and analyze societal norms, ethics is inherently prescriptive, offering guidance on moral action within its domain of study. In other words, the object is to attain summum bonum, which is defined as the "highest good for human beings" (Deigh, 2010, p. 15).

Environmental ethics, developed within the field of philosophy, critiques the human-focused view of Western moral theories. It examines what changes should be made and how to respond to environmental damage (Hourdequin, 2024). This study contributes to

the field of environmental ethics by examining how actions to reduce GHG emissions, such as offsetting emissions via the VCM, affect smallholder farmers.

2.4 The Conceptual Framework – Mepham's matrix

To conduct an ethical analysis of the impact of the VCM on smallholder farmers in the Global South, Mepham's matrix is going to be used as a conceptual framework. Developed in 1999 by Professor Ben Mepham, a member of the Food Ethics Council, the matrix supports ethical decision-making and stands out with its ability to cover a wide range of ethical issues. It recognizes that an ethical issue should be approached by more than just one ethical theory and therefore includes three major theories and commonly used terms that make it possible to discuss the issue at hand from different perspectives: Respect for *well-being* (Utilitarianism), respect for *autonomy* (Kantianism), and respect for *justice* (Rawlsian theory). Although the matrix can be applied to a wide range of the ethical field and most common ethical concerns, covering every angle with those three principles is impossible. However, Mepham states that the fundamentals of common morality, which assumes that there are moral rules that are accepted by all humans and is related to universal morality (Paranhos et al., 2019), are addressed. Thus, the matrix proves to be suitable to cover a wide range of perspectives since most people would agree with the three chosen principles. The principles offer benchmarks that may be used to identify and evaluate differences in opinion, factual ambiguities, and varying presumptions (Food Ethics Council, n.d.).

2.4.1 Respect for Well-being (Utilitarianism)

The principle "respect for well-being" in Mepham's matrix matches the ethical theory of utilitarianism based on John Stuart Mill (18th and 19th century), who considered the quality and intensity of benefits and harm and asked the question "what effect will (an action) in this situation have on the general balance of good over evil?" (Markkula Center for Applied Ethics at Santa Clara University, 2024, p. 3). To find the best action, utilitarianism uses a form of cost-benefit analysis, which can be a useful approach to widen the horizon from one's perspective to "the good of all". Issues with this theory might occur as it requires giving benefits and harms a certain value to make them comparable. Furthermore, it

relies on predictions regarding the possible outcomes, and full certainty that all consequences have been considered can never be reached (Markkula Center for Applied Ethics at Santa Clara University, 2024).

2.4.2 Respect for Autonomy (Kantianism)

The notion of "rights" by Immanuel Kant (18th century) can be seen in the second principle "respect for autonomy". In contrast to utilitarianism, Kant valued respect for each individual, not a cost-benefit analysis and believed in treating others with inherent value and respect, which the Golden Rule "Do as you would be done by" indicates. The problem with this approach is that there is no indication of what to prioritize. A situation might occur where telling the truth might harm people, in which Kantianism does not tell whether to prioritize the duty to shield others from harm or to be honest (Food Ethics Council, n.d.). This principle gives a guide on whether the stakeholder has, for instance, behavioral freedom or respect for choice, depending on the stakeholder and the situation (Mepham, 2000).

2.4.3 Respect for Justice (Rawlsian theory)

Assuming the scenario of an ideal society, Rawlsian's work "Justice as Fairness" suggests that everyone is fully autonomous, with equal basic rights, having the opportunity to work together in a fair, egalitarian capitalist system, which forms the third principle in the matrix "respect for justice". He also states that justice as fairness is a better alternative to the dominant tradition in modern utilitarian thought. Justice and fairness are related terms that are often used as synonyms, whereas justice focuses on giving everyone what they deserve, and fairness describes the ability to judge and evaluate a situation without basing it on feelings or interests (Food Ethics Council, n.d.; Velasquez et al., 2014).

In Mepham's matrix, the three ethical concepts serve as the foundational columns of the table, and considerable stakeholders form the rows, allowing an analysis of autonomy, well-being, and justice. The tool accommodates any stakeholder with ethical standing, while there is a suggested maximum number of four rows/stakeholders to include in the matrix (Mepham, 2000). As this study focuses solely on smallholder farmers, they are the

only stakeholders that will be considered in the matrix, as shown in Table 1, in which the cells form the description of the ethical theories for the stakeholders considering the issue at hand (Food Ethics Council, n.d.). For the first column, the income, working conditions, and overall livelihood of the smallholder farmers participating in the VCM will be analyzed by comparing the benefits and pitfalls of participation in the VCM. The second column includes the evaluation of freedom of choice and how autonomous the farmers are in joining carbon credit projects, and in the third column, the fairness of contracts and obligations of smallholder farmers in crediting projects will be studied.

Table 1 - Mepham's Matrix

Respect for:	**Well-being**	**Autonomy**	**Justice**
Smallholder Farmers	*Income and working conditions*	*Freedom to implement agroforestry in carbon credit projects*	*Fair treatment in trade and law*

Note: Table based on (Mepham, 2000)

3 Research Methodology

3.1 The Research Approach

A constructivist's qualitative research approach has been chosen for this thesis, which emphasizes depth over breadth in its exploration of meanings, perceptions, and experiences (Creswell & Creswell, 2023). The reason for choosing this approach is to gain a better understanding of the participants' perspective and experiences, as it aims to capture the complex knowledge and insights of stakeholders. As the impact of the Voluntary Carbon Market (VCM) on smallholder farmers and its ethical considerations is a rather new topic in the existing literature, a qualitative approach under such circumstances should be adopted as recommended by Creswell & Creswell (2023).

Stakeholder interviews have been chosen over surveys, since open-ended replies and conversations are necessary for examining the scope of the professionals' knowledge (Creswell & Creswell, 2023). Furthermore, qualitative research can be adjusted to changing study circumstances and new information that comes to light during the data collection, which can be useful for this topic, as the findings may take multiple turns (Creswell & Creswell, 2023).

3.2 Methods for Data Collection

3.2.1 Literature Review

To build a thematic foundation, gain background knowledge, and get an overview of the existing literature that can contribute to answering RQ 1, RQ 2, and RQ 3, a broad literature review has been conducted using Google Scholar and Web of Science as the main search engines. Keywords such as "Smallholder farmer", "Carbon Offset", and "Global South" were identified, and combinations like "Smallholder farmer in VCM", "Agroforestry Project", and "Ethical consideration of VCM" were used to search for scientific papers, articles, and relevant books. These sources provided insights into the theory and common practices of the VCM, the participation of smallholder farmers, and their role and practices. Furthermore, ethical concepts were studied using existing

academic literature. While doing so, it was ensured that the material is timely to guarantee current data is being used and thus support the relevancy and actuality of this thesis.

3.2.2 Thematic Document Analysis

Following the literature review, a thematic document analysis was conducted, which contributed to answering RQ 1 and RQ 2. This method provided further insight into the impact the VCM has on participating smallholder farmers as well as how much smallholder farmers are being considered in the projects, their development, and the VCM standards. Document analysis as a qualitative method brings advantages such as efficiency and stability, as the papers don't react to the review (Bowen, 2009).

Documents were found and accessed via Google using keywords like "Smallholder farmer", "Carbon Project", and "VCM agroforestry project". Nine documents have been analyzed, covering project reports of VCM projects applying agroforestry, verification standards, a case study of an analyzed agroforestry project, and a participant agreement (see Table 2).

Table 2 - Analyzed Documents

Name	**Document Type**
REDD Project	Project Report
SAFE Project	Project Report
Rabobank-Acorn Colombia	Project Report
Rabobank-Acorn Uganda	Project Report
Trees for Global Benefit Project	Project Report
Global Forest Coalition Case Study	Case Study of Trees for Global Benefit Project
Participant Agreement Acorn	Participant Agreement
Carbon Standards Verra	Verification Standards
Project Requirements Plan Vivo	Verification Standards

The chosen agroforestry projects differ in size, location, and verification organization. The REDD reflects one of the largest VCM initiatives and the analyzed project is located in

South Kwamouth, Democratic Republic of Congo (African Development Bank Group, 2011). The SAFE Project, a rather young project is verified by Verra and located in Karnataka, India (SAFE, 2025). Both Rabobank-Acorn projects are located in Columbia and Uganda and verified by Plan Vivo (Rabobank, 2022a, 2022b), which is the verification organization of the Trees for Global Benefits Project as well, located in Uganda (ECOTRUST, 2020). To be able to compare the statements of a project report and the reality that smallholder farmers experience, a case study of the Trees for Global Benefits Project was analyzed (K & Kamukama, n.d.) and gave valuable insights into differences of project aims and documentation and their reality. Additionally, the participant agreement (Acorn & Solidaridad, 2024), to gain insights into the legal project documents, and the standards of Plan Vivo and Verra as verification organization have been analyzed (Plan Vivo, 2024; Verra, 2024) providing practical insights into their in terms of stakeholder involvement and how the requirements are implemented in the different analyzed projects.

3.2.3 Semi-structured Interviews

According to Bowen (2009), combining a document analysis with interviews corresponds well and is a frequent technique in academic research, which supports the conducted semi-structured interviews with two representatives of Solidaridad Peru. The two interviewees (see Table 3) are affiliated with Solidaridad as the local partner of the Rabobank-Acorn project in Peru, which implements agroforestry practices with smallholder farmers. Their expertise in VCM carbon projects builds on the findings from the literature review and document analysis, adding valuable practical insights into another project.

The one-hour-long Interviews were conducted and transcribed via Microsoft Teams, contributing to RQ 1, RQ 2, and RQ 3. Open-ended questions were asked (see Appendix A) and were formulated based on the conceptual framework and the three research questions. The interviews took place in April 2025.

Table 3 - Overview of Interviewees

Interviewee	Organization	Role
Interviewee 1	Solidaridad Peru	Coordinator of Rabobank-Acorn project Peru
Interviewee 2	Solidaridad Peru	Employee of Solidaridad supporting the coordination of the Rabobank-Acorn project Peru

3.3 Methods for Data Analysis

The findings of both document analysis and interviews were analyzed using the conceptual framework, Mepham's matrix, as a lens to study the impact of actions or decisions, providing a comprehensive and balanced approach. The main goal of the matrix is to clearly and widely explain the ethical aspects of the given topic. The principled approach makes it ethically neutral and analytical, leaving space for judgment for specific situations (Mepham, 2000). Its key ethical categories well-being, autonomy, and justice, were used to interpret the results (presented in Chapter 4) from multiple perspectives (Mepham, 2000).

As described in Bowen (2009), a combination of deductive and inductive coding was employed to analyze the data. Deductive coding was used to identify set of codes based on the ethical concepts of Mepham's matrix, the research questions, and the key themes identified during the literature review before the actual coding process. These codes served as a structured starting point and included codes such as "Benefits of the VCM", "Respect for justice", and "Direct impact". Inductive coding was used to allow new codes to appear from the documents/transcripts. This method ensured that insights or context-specific information and patterns were also considered. Two cycles of coding have been conducted to refine and categorize the codes (Bowen, 2009). The complete codebook can be found in Appendix B.

To support the coding and analysis process, Atlas.ti was used as a software tool facilitating the organisation of codes and categories across multiple data sources. It also helped visualize relationships between codes and identify patterns across interviews and documents.

3.4 Reflection on Data Gathering

This thesis will only consider smallholder farmers in the global south who participate in carbon projects applying agroforestry. In terms of constraints on the research, access to a variety of project reports and reliable information to assess the actual impact on smallholder farmers can be identified as the biggest limitation. It can be considered critical that this thesis aims to assess the impacts on individuals who were not included in the research. Since this is an ethical thesis, the goal is to stay as objective as possible, but it needs to be taken into account that the background and personal values of the researcher cannot be totally eliminated and ignored in the assessment, as stated by Creswell & Creswell (2023). Subjectivity is a significant consequence of employing a qualitative, constructivist methodology. The researcher's interpretations and preconceptions impact the results, which might have an impact on the analysis and presentation of the data. Another limitation is the generalization of the findings, as qualitative research focusses on specific contexts, making it challenging to apply the results to a broader field (Creswell & Creswell, 2023).

It further needs to be taken into account that the selected documents won't reflect an unbiased collection, that the access to some documents was restricted, and that the purpose and context of the documents differ from the research of this thesis (Bowen, 2009). Unfortunately, it has been quite difficult to access primary project data and thus generate a wide overview of several projects, which adds to the limitations of this research. The findings from the interviews need to be viewed as subjective and based on the interviewee's perspective, which appeared to be less critical. Additionally, some important actors who could have helped answer the research question were not reachable and couldn't be included, limiting the scope of the accessed data. The conceptual framework is limited by the accuracy of the data. Including different stakeholders will also mean that conflicts of interest can appear which have not been considered. Furthermore, the evaluation demands a scoring of the identified impact, which can change depending on the concept used and the personal perspective (Mepham, 2000).

4 Results

There are scientific and ethical discussions about the Voluntary Carbon Market (VCM) itself, but there is little literature on the impact of this market on smallholder farmers participating in it, analyzed from an ethical perspective. This chapter is structured along the three research questions of this study (see Chapter 1). The conceptual framework, Mepham's matrix (see Chapter 2), is applied to the third research question to structure the results.

4.1 Impacts of the VCM on Smallholder Farmers

To answer RQ 1 and identify the impacts on smallholder farmers participating in the VCM, the following documents shown in Table 4 have been studied.

Table 4 - Analyzed Documents for RQ 1

Carbon Project Name	Document Type	Citation
Global Forest Coalition Case Study	Project Case Study of (ECOTRUST, 2020)	(K & Kamukama, n.d.)
Rabobank-Acorn Colombia	Project Report	(Rabobank, 2022a)
Rabobank-Acorn Uganda	Project Report	(Rabobank, 2022b)
REDD Project	Project Report	(African Development Bank Group, 2011)
SAFE Project	Project Report	(SAFE, 2025)
Trees for Global Benefit Project	Project Report	(ECOTRUST, 2020)

The results are structured along the three-pillar approach of sustainable development, which covers the economic, social, and environmental dimensions (Baker, 2016), which are further clustered thematically.

4.1.1 Economic Impact

Income

Several project reports and both interviews show that the additional income through the sale of Carbon Removal Units (CRUs), as an easy and understandable incentive, is the

most visible benefit for smallholder farmers. A representative of Solidaridad Peru confirmed that the “main reason producers are willing to be onboarded into a program is the economic aspect”, which is supported by the case study of K & Kamukama (n.d.) analyzing the ECOTRUST (2020) project in Uganda. Project report and both interviewees state CRUs contribute to additional income on top of their revenue earned by their farming activities and decrease poverty (African Development Bank Group, 2011; Rabobank, 2022b, 2022a; SAFE, 2025). However, one representative of Solidaridad Peru and K & Kamukama (n.d.) highlighted unintended consequences: some farmers seek to maximize the CRUs income by clearing more land for trees, contrary to the goals of agroforestry. Moreover, one interviewee explains that the additional revenue ends after 20 to 30 years, when the trees reach their full capacity of biomass, leading to no further creation of CRUs.

Both representatives of Solidaridad Peru emphasize that it is not beneficial to look at the income separately from the other connected benefits and challenges of agroforestry. “You have to see it as a whole (…) system of benefits” the coordinator of the Rabobank-Acorn project Peru states, and continued that the extra income is a bonus on top of the other benefits, but it’s “not going to solve all their problems”. Rabobank (2022b) notes that the additional revenue provides a “financial buffer” enabling farmers to preserve trees during economic hardship, purchase materials, and maintain the system.

The ECOTRUST (2020) project promotes similar benefits in its report, describing itself as an innovative restoration initiative, improving local livelihoods and generating several benefits. However, K & Kamukama (n.d.) documented lower and delayed payments led to increased economic instability and forced several participants into debt. K & Kamukama (n.d.) further state that the project does not recognize the dynamics of the local economies.

While some sources report sufficient financial benefits (African Development Bank Group, 2011; Rabobank, 2022b; SAFE, 2025), K & Kamukama (n.d.) and all stakeholder interviews reflect a rather low and insufficient financial compensation. A Solidaridad Peru representative explained that while the income may appear very little compared to the efforts and work required from the farmers, this view only holds when focusing solely on financial returns and ignoring other co-benefits the project provides. Both

interviewees state that the projects work with smallholder farmers only; thus, the number of CRUs they can generate is limited by the spatial factor and restricts scalability on the farm.

Bureaucracy

The operational and bureaucratic tasks are handled by the local partner and project developer, which keeps those efforts from the farmers (SAFE, 2025), but still creates indirect burdens. Both representatives of Solidaridad Peru mentioned high workload and coordination challenges. Since the revenue is divided between the project developer, local partner, and smallholder farmer, high operational costs will reflect the share that the farmers receive. A Solidaridad Peru representative explains that the Rabobank-Acorn program currently allocates 10% to the project developer (Rabobank-Acorn), 10% to the local partner (Solidaridad Peru), and 80% to the farmer. A future shift to 15-15-70% is expected due to rising operational costs that are not covered by the 10% share anymore. In Peru, national regulations, like land title requirements, create barriers for smallholder farmers. This complexity limits farmers' ability to access the VCM and prevents them from selling CRUs, ultimately hindering their participation in carbon projects. This favors large projects and excludes smaller initiatives, a Solidaridad Peru representative explains, which is underlined by Rabobank (2022a) stating that there is a "lack of projects that enable farmers to access the international carbon markets" (p. 7).

Transition to Agroforestry

In addition to the income, there are several indirect economic effects that farmers experience when implementing agroforestry. Carbon projects often provide the technical skills, recourses, infrastructure, and initial capital that farmers lack to implement optimal agroforestry systems (Rabobank, 2022b, 2022a). Nevertheless, as both interviewees and Rabobank (2022a, 2022b) state, costs are a restricting factor in terms of implementing and scaling agroforestry practices, due to the lack of financial means of the farmers to purchase tree seedlings. Solidaridad Peru currently develops a loan system in which crop trees are provided to the farmers, which will be repaid through future CRUs' income. This system is not in practice yet, but the local partner organization, the project developer, and different nurseries currently help with the first investment, one Solidaridad Peru

representative states. Furthermore, the provided technical support for agroforestry, fertilizer, and planting systems, as well as the education given by the project, gives the farmers financial advantages (Rabobank, 2022b).

Without support of the project developer or intermediaries, as seen in ECOTRUST (2020), farmers may overcrowd their farms with trees, compromising space for agriculture, which secures food resources for the family and community, as K & Kamukama (n.d.) discovered.

Production & Food Security

Agroforestry impacts the existing agricultural systems, as Rabobank (2022b) noted increasing production and quality of the crops, enabling farmers to sell their harvest at higher prices. Initial yields may drop 5% in the first one to three years but improve by 15-20% later, due to the newly established agricultural environment that plants have to adjust to (Rabobank, 2022a, 2022b; SAFE, 2025). Contrarily, K & Kamukama (n.d.) state that the farmers experience dry soil and decreased crop health due to overplanting of trees without guidance.

With additional income and increased production, some projects state to contribute to decreasing poverty (African Development Bank Group, 2011; Rabobank, 2022b). African Development Bank Group (2011) reports benefits from new jobs, and a "financial spin-off" generated through agroforestry. As most farmers face enormous food insecurities with skipped meals and a lack of variety (Rabobank, 2022b), additional income and higher productivity on the farm allow farmers to purchase a wider variety of food and increase food security (African Development Bank Group, 2011; Rabobank, 2022b, 2022a). Rabobank (2022b, 2022a) observed an improved nutritional status of the communities, and ECOTRUST (2020) reports similar effects that were refuted by K & Kamukama (n.d.) stating worse food and financial insecurities that farmers face since joining the project.

4.1.2 Social Impact

Livelihood

ECOTRUST (2020), Rabobank (2022a, 2022b) and SAFE (2025) state the possibility of increased livelihood of farmers through production improvements, additional income,

and financial stability. This supports farmers in overcoming poverty and climate change-related challenges. SAFE (2025) commits to continuously improving farmers' livelihood. Without carbon finance, the adoption of agroforestry would be restricted by socio-cultural dynamics, gender roles, availability of inputs, and a knowledge gap on agroforestry (Rabobank, 2022a). Yet again, K & Kamukama (n.d.) state negative impacts on participants' livelihoods that cause more harm than benefits, regardless of the assurances given in the ECOTRUST (2020) project report.

Education

Participation in carbon projects includes education and training for farmers to varying extents. SAFE (2025) is committed to offering "frequent training to educate farmers on sustainability" and has an "awareness program to educate farmers about the benefits of agroforestry" (SAFE, 2025, p. 14). The analyzed African Development Bank Group (2011) Project states that the project contributes to children's schooling and education for adults. Rabobank (2022a) hires local agronomists who train and advise the farmers on tree species according to their land and crops and applies a knowledge-sharing approach. Farmers who have received training serve as role models, encouraging others in their community to implement climate-smart agriculture (CSA) on their fields. A Solidaridad Peru representative mentions that a learning platform is currently being developed in the Rabobank-Acorn project in Peru for farmers to access and gain information about the project's benefits and requirements online, making it more accessible to young farmers. Project employees have encountered farmers who are skeptical or unaware of climate change. The provided education aims to change their mindset and help them understand the situation, adapt and become more resilient, both interviewees state. Furthermore, the additional knowledge can help farmers to value the trees for the long-term ecosystem services they provide, instead of only the timber (Rabobank, 2022b). SAFE (2025) conducts training to get more farmers involved in the project, but participants state the training was more structured like a sales pitch instead of providing useful education (K & Kamukama, n.d.).

Another social aspect influenced is the role of farmers in their communities. By participating in the Rabobank-Acorn project in Peru, farmers develop (leadership) soft skills, they are more informed and educated, and positively influence the community;

they become leaders in their community, a Solidaridad Peru representative states. Rabobank (2022a) uses a lead-farmer approach, where lead farmers provide information to other farmer groups and support the training.

They further promote women's involvement in tree planting and management of the agroforestry system (Rabobank, 2022a). Such support can also be seen in the REDD+ project, which integrates methods that particularly benefit women by providing them with processing and marketing skills, which will "enhance their socioeconomic status" (African Development Bank Group, 2011). On the contrary, the ECOTRUST (2020) project is mostly paying the male member of the family, causing stress and conflicts within the family and community (K & Kamukama, n.d.).

Communication & Understanding

The interviews uncover that the communication and understanding of the farmers is a big challenge. Solidaridad Peru representative states that they communicate in the best way they can and are trying to make it understandable for the farmers, using drawings, little books, a lot of meetings, and a contact for further questions or concerns. They aim to use a less technical language to be more understandable, which also reflects the rebranding of the Rabobank-Acorn projects in Latin America - "Asombrate" (Asombrate Colombia, n.d.), which means "shade yourself" and supports a better understanding of the farmers. Solidaridad Peru translates and rewrites important documents to make them readable and understandable for non-legal and field professionals, a Solidaridad Peru representative explains. Within the analyzed Rabobank-Acorn projects, it is visible that the projects are in constant collaboration with the farmers and local community, hold focus group discussions, and conduct on-farm visits (Rabobank, 2022a, 2022b). The SAFE (2025) project report also mentioned their communication strategy, which includes frequent meetings and interactive sessions, providing relevant information, benefits, and potential risks.

Both interviewees explained that, despite ongoing efforts, many farmers still lack a clear understanding of the carbon market and their role in it. In the Rabobank-Acorn project in Peru, there was an incident where individuals unaffiliated with the project falsely claimed to represent Solidaridad, approached farmers, and charged them fees to collect plots.

Since participation in these carbon projects is entirely free for farmers, this situation highlights a gap in farmers' awareness of their rights and the functioning of the market, leaving them vulnerable to misinformation and exploitation. This is underlined by the case study of K & Kamukama (n.d.), which states that the ECOTRUST (2020) project lacks communication, information, and support, and its participants are often "not fully aware of the details" (p. 9) since the contract is provided in English only.

4.1.3 Environmental Impact

Agroforestry

The implementation of agroforestry systems has several effects on the surrounding environment. For agroforestry itself, there is a whole list of benefits that have a positive impact not only on the farmers' overall well-being and farming practices, but also on the environment. To mention just a few: it increases the resilience to climate change, avoids deforestation, reduces and sequesters carbon emissions, generates better soil quality, fixes more nutrients, provides shading for crops which leads to higher quality of crops and harvest, improves water cycle of the farm, creates extra biomass & fertilizer, generates better micro climate, increases carbon storage on farm, increases total productivity on farm, and reduces soil erosion (Acorn & Solidaridad, 2024; Rabobank, 2022a, 2022b; SAFE, 2025). A challenge to the large number of benefits is that they will only be seen in the long term, not immediately; it is more of an investment for the future. A potential challenge identified with agroforestry is that it must follow a design to avoid overcrowding the farm with shade trees, which can affect the crop (the main income source) negatively, as it only needs a certain amount of shade. Planting beyond the limit of the design or without any design at all could harm the crops and harvest, as a Solidaridad Peru representative and Rabobank (2022b) state, which can be seen on the farms participating in the ECOTRUST (2020) project, in which farmers experience dried coffee plants and smaller harvests (K & Kamukama, n.d.).

Land Use Change

Rabobank (2022a) states that without carbon project intervention, no trees would be planted on the farm, and the existing trees would eventually be cut down to increase

agricultural production and sell the timber. Rabobank (2022b) mentions the current deforestation behavior of smallholder farmers in developing countries, which can be slowed down through the incentive to earn money by keeping the trees. In the ECOTRUST (2020) project, farmers increased to use their land for forestry and decreased agricultural activities to generate more CRUs (K & Kamukama, n.d.).

To summarize the main impacts: the financial incentive in the VCM is the main motivator for farmers, even driving land-use change that decreases agriculture for CRUs maximization. Because after 20-30 years, CRUs creation becomes limited, long-term economic sustainability is uncertain. But the system needs to be approached holistically, also considering environmental and social benefits. Bureaucracy remains a barrier, with regulatory demands limiting farmers' participation, and agroforestry requires a system and careful planning to be beneficial. Finally, a major challenge is communication, since many farmers lack the understanding of their rights.

4.2 Rights of Smallholder Farmers in the VCM

To participate in the VCM, certain legal procedures are required that influence the experience of smallholder farmers when participating in the market. To sell CRUs, specific standards of the chosen verification organization by the project need to be implemented when setting up the project design. To identify the rights of smallholder farmers participating in the VCM and being able to answer RQ 2, the participation agreement of the Rabobank-Acorn projects for Solidaridad and two verification standards have been analyzed, as shown in Table 5.

Table 5 - Analyzed Documents for RQ 2

Document	Document Type	Citation
Participant Agreement Acorn	Participant Agreement	(Acorn & Solidaridad, 2024)
Carbon Standards Verra	Verification Standards	(Verra, 2024)
Project Requirements Plan Vivo	Verification Standards	(Plan Vivo, 2024)

Verification Standards

Generally, the verification standards are kept relatively broad, which leaves room for interpretation depending on the situation. Plan Vivo (2024) demands the contribution to increasing livelihood, and the benefits of the project participation must go beyond the revenue of the CRUs' sales and have long-term livelihood benefits for participants. When entering a project, farmers must sign a project agreement (e.g. Acorn & Solidaridad (2024)) in line with the principles of Free, Prior and Informed Consent (FPIC) (Plan Vivo, 2024).

Regarding the communication with stakeholders, both organizations, Verra and Plan Vivo, require the projects to have a communication strategy, to enable stakeholders to raise their concerns, involve them during the design and implementation of the project, and consider stakeholders' input in updates of the project design (Plan Vivo, 2024; Verra, 2024). Project coordinators of certified Plan Vivo projects must inform stakeholders throughout the project and update them at least once a year, while the materials, including legal documents, should but don't have to be provided in the preferred language. All effects of the project need to be communicated beforehand, and it needs to be ensured that "Project Participants (...) fully understand all details in their Land Management Plans" (Plan Vivo, 2024, p. 19). In addition to the effects, the minimum amount that participants are entitled to if monitoring targets are met, and the consequences if not, need to be communicated and incorporated into the project agreement. Furthermore, projects verified by Plan Vivo have to set up a grievance mechanism to ensure active reporting of any incidents directly and indirectly related to project activities and have to have a clear governance structure and decision-making process that integrates feedback from participants (Plan Vivo, 2024).

Verra's standards and Plan Vivo's project requirements obligate that the project design and implementation respect human rights, workers' rights, and need to align with relevant national laws and regulations. Property rights are important to be covered as the CRUs are created through trees planted on farmers' properties. Verra's standards cover this by compelling the project to recognize, respect, and support these rights and take action to secure them. The projects are not allowed to interfere with farmers' properties as well as the land title. It is defined that the land ownership rights lie with the farmer,

whereas the carbon credit is owned by the project proponent (Verra, 2024). With a livelihood baseline scenario, Plan Vivo projects are required to describe and monitor how interventions impact livelihood, ecosystem, and what benefits they generate using livelihood indicators. If the anticipated benefits are not realized and negative impacts arise, corrective measures should be implemented (Plan Vivo, 2024).

The Verra's standards further require the creation of a benefit-sharing agreement, which distributes benefits in ways that respect local cultural norms, through which interpretation of this can vary and may serve the interests of different stakeholders. The creation of such a document serves the purpose of transparent, just, and fair compensation. No further specification on the percentage or amount of revenue that farmers are entitled to is stated, which leaves the revenue distribution to the project developer (Verra, 2024). Plan Vivo's project requirements similarly demand a distribution of benefits according to a benefit-sharing mechanism, which entailed the contribution of project participants in its creation. The exact shares are to be defined in this mechanism, where at least 60% are entitled to the farmers (Plan Vivo, 2024).

In terms of risk mitigation, Verra verified projects need to identify and mitigate any risks towards stakeholders' well-being that are natural and human-induced; the same applies for any negative impact related to project activities, specifically mentioning impacts to the natural environment and communities. Economic, social, and environmental impacts and risks shall be included in a preliminary assessment that has to be conducted, which shares the results, risks, costs, and benefits with the stakeholders. Verra's carbon standard requires projects to provide equal opportunities for every gender in terms of employment and participation, as well as ensuring that discrimination and sexual harassment don't occur within the project. It prohibits projects using forced labor, child labor, and human trafficking and ensures the protection of workers employed by third parties. Finally, the standard demands active monitoring, including roles and responsibilities, and projects need to contribute to at least three Sustainable Development Goals (SDGs) (Verra, 2024).

Plan Vivo's requirements state that any social, environmental, or cultural risk needs to be considered, and mitigation activities put in place where necessary to a level that meets the expectations and needs of those negatively impacted. If negative environmental or

social impacts appear, projects are obliged to report to Plan Vivo immediately. In any project, local representatives shall be included in the development to ensure concerns are understood and considered (Plan Vivo, 2024).

Internal Project Regulation

A closer look at the projects and their regulations for smallholder farmers reveals that the Rabobank-Acorn initiatives, verified by Plan Vivo, provide farmers with a consent form explaining data use and a 25-year participant agreement (Acorn & Solidaridad, 2024) detailing rights, obligations, requirements, and allowing them to step out at any time. The agreement also clarifies that the sale of CRUs is not guaranteed. It outlines the revenue-sharing, allocating 20% to Rabobank-Acorn and the local partner, such as Solidaridad, and 80% to the farmer. Additionally, it emphasizes that participation is entirely voluntary, and the final decision rests with the farmer. To ensure farmer representation, a project council was implemented, where farmers' representatives meet twice a year with their local partner to raise concerns and discuss key issues. Both interviewees highlighted that the new Rabobank-Acorn framework 2.0 will further strengthen farmers' voices in the process.

The SAFE (2025) project, verified by Verra, also provides a consent form that includes a project description, benefit sharing plan, land document, and further relevant information to avoid legal risks. The revenue-sharing follows a design ensuring farmers receive the majority of benefits, such as increased livelihood and productivity. To maintain transparency and engagement of the community, this system was reviewed with stakeholders. The project also held stakeholder meetings with most farmers, allowing them to participate in the project design and voice concerns and challenges at any time.

Stallholder Farmers Responsibilities

Smallholder farmers hold certain responsibilities when entering the VCM projects, which are agreed on in the participant agreement (of Rabobank-Acorn projects). They are required to maintain the trees planted on their farm and keep them alive for the project time (25 years). They need to keep their own CO_2 emission low, and it is obligatory to update the local partner about any changes and provide the necessary information

needed for the creation of CRUs. No further detailed requirements or actions are mentioned (Acorn & Solidaridad, 2024).

The documents show that the analyzed verification organizations aim to protect smallholder farmers, covering basic human rights, informed consent, and stakeholder engagement. Plan Vivo provides more specific requirements, while Verra leaves more room for interpretation. While it seems like the standards cover every aspect of proper stakeholder engagement the findings above show, that not all requirements are met.

4.3 Ethical Analysis

The findings are now analyzed through the conceptual framework, Mepham's matrix, to determine whether the impact of the VCM on smallholder farmers is ethically justifiable. Table 6 provides an overview of the main findings, linked to the three ethical principles of Mepham's matrix, which will be discussed below. The column "Respect for Well-being" presents the main findings divided into positive and negative aspects, as utilitarianism suggests a cost-benefit analysis. In the columns "Respect for Autonomy" and "Respect for Justice", this categorization has been actively avoided to align with the related ethical theories.

Table 6 - VCM Impacts on participating Smallholder Farmers and their rights in Mephams Matrix

	Respect for Well-being	Respect for Autonomy	Respect for Justice
Smallholder Farmers	+ Additional income + Support from the local partner + Education & training + Socio-economic benefits + Benefits of agroforestry + Increased production after three years + Improved livelihoods - Incentive to plant more trees than beneficial - Late payments causing financial hardship - Farm size limits CRUs sale - Little income for high efforts (not sufficient to support families) - Increase food insecurity - Dependency on project for initial implementation - Most benefits visible in the long term - Farmers are not fully aware of their rights, thus vulnerable to exploitation - Decreased production in the first years	• Are farmers joining voluntarily when they dont fully understand the process? • Do farmers really have behavioral freedom after initial investment and high efforts? • Do farmers feel powerful enough to raise their concerns and demands? • Final decision rests with the farmer • Farmers in vulnerable position driven by the promised additional income • Farmers are not fully aware of their rights • Projects are working with a communication plan to inform farmers about all aspects • Exploitation scenario happened, showing that farmers are in a vulnerable state	• Official agreements regulating legal relationships • Verification standards regulate requirements for project designs covering human rights, monitoring, benefit-sharing, risks, and regulations • Participation of stakeholders in a project council • Agreements set up by the project developer • Documents explain risks, costs, and benefits • Possibility to cancel the agreement in some cases • Distribution of revenue is clearly formulated • Long-term contacts (up to 25 years)

Note: Table created by the author based on (Mepham, 2000)

4.3.1 Respect for Well-being

The principle of respect for well-being (see Chapter 2.4.1) refers to the ethical theory of utilitarianism and focuses on the effects of an action on the overall balance of good and evil. Thus, an overview of the main benefits and risks follows.

The additional income for smallholder farmers participating in carbon projects is one of the key topics in the discussion regarding their participation in the VCM. Several project documents indicate that the income generated from the sale of CRUs contributes to poverty reduction, improved livelihoods, enhanced economic status for the farmers, and better access to infrastructure and tools. However, interviewees clarified that the income

derived from carbon sequestration is relatively low and does not sufficiently cover the efforts and investments associated with agroforestry alone. Moreover, the generation of CRUs is also constrained by the size of the farms. Thus, even after high implementation costs and efforts towards establishing an agroforestry system, there are scalability limits to the additional income. It seems that smallholder farmers also find it challenging to understand how the VCM system operates, their role within it, and their rights. A lack of awareness and certainty regarding their rights makes them highly vulnerable to exploitation and practices that may disadvantage them if the project developer prioritizes their interests. Due to a lack of knowledge, farmers can be influenced by the local partners and project developers. As a representative of Solidaridad Peru noted, farmers place immense trust in the project that Solidaridad has developed, which could be exploited against them if misused. Furthermore, a misunderstanding of the approach results in misconceptions about the VCM system. As previously highlighted, some farmers intended to plant more trees than beneficial for agricultural practices, or even quit food production altogether to focus solely on creating CRUs on their farms. This decision doesn't give them any additional income from their harvests, but also diminishes the agroforestry benefits for their crops. This situation was evident in the ECOTRUST (2020) project, where farmers signed long-term contracts based on monitoring targets that they were required to meet. Several participants ended their agricultural activities to produce more CRUs, and delayed payments for these farmers resulted in financial instability, leading to debt, as they had no alternative sources of income. Moreover, the ECOTRUST (2020) project appears not to provide any support to the farmers, as observed in the Solidaridad project. Financial and food security should be ensured during the initial years of planting and growing trees when agricultural production declines, to prevent further instability. However, if implemented correctly, agroforestry and the generation of CRUs can yield numerous benefits in the long term for smallholder farmers, including education and training, social gains, and environmental advantages from the systematically planted trees in their fields.

The treatment of farmers and the benefits they receive largely depend on the project developer and its motivation and values. Project reports indicate that most farmers are experiencing food insecurities, which intensifies the decline in agricultural production

during the initial years, potentially worsening farmers' situations. Similarly, the significant investments required for implementing agroforestry systems may be covered or supported by the project developer or local partner. While Solidaridad demonstrates a strong commitment to working in favor of the farmer by providing education, training, and ensuring optimal stakeholder communication, other projects may not be as proactive, potentially harming the well-being of farmers. Plan Vivo insists on long-term benefits that extend beyond the sale of CRUS, which must be monitored every five years. Although this requirement appears reasonable and advantageous for farmers, the case study by K & Kamukama (n.d.) reveals that, in practice, the situation differs, and in this case, the costs outweigh the benefits.

4.3.2 Respect for Autonomy

The principle of respect for autonomy (see Chapter 2.4.2) points out the respect for each individual and the importance of treating others with respect and value. Findings contributing to this perspective are now mentioned. In project documents and by the interviewees, it's stated that farmers are joining the carbon projects voluntarily with FPIC and that the last decision on what is going to happen on their farm lies with the property owner, hence the farmer. Yet, decision-making and voluntariness can be influenced easily since most farmers are in a vulnerable position, facing food insecurities and low income. The understanding of their rights and the process is important for the farmer to secure their autonomy and receive the most benefits. Plan Vivo's project requirements intend to ensure this understanding, but after speaking to the farmers reality shows otherwise. Since knowledge and understanding are not entirely secure in the legal documents and practice, it can be questioned whether the smallholder farmers have the freedom to make well-considered decisions, even though every project states to inform their participants about all possible impacts and effects. The earlier-mentioned incident of farmers' exploitation by non-project members underlines their vulnerability.

Behavioral freedom is embedded in the carbon standards, which keeps the project developer and local partner from interfering in farmers' properties and leaves the option for the farmer to leave the project at any time. The participation in project councils, meetings, and other communication tools should ensure the farmers' ability to raise

concerns and provide feedback at any time, which also needs to be considered by the project developer.

The respect for the individual can be seen with Solidaridad Peru taking care of their responsibilities and beneficial practices towards the farmers, but is missing in other projects like ECOTRUST (2020), and is certainly not a requirement for project developers to enter the VCM and onboarding farmers, but rather a value that lies within the project organization.

4.3.3 Respect for Justice

The last principle, respect for justice (see Chapter 2.4.3), focuses on fairness and examines whether everyone gets what they deserve, without basing it on feelings or interests. Thus, the juristic circumstances are pointed out in the following. With contracts, standards, and legal agreements, the relationships between stakeholders in carbon projects and benefit shares are regulated in a lawfully correct manner. Nevertheless, the VCM is known to be little regulated, which can be seen in the relatively open formulated standards of the analyzed verification organizations, which cover basic rights, thereby securing the foundation for respectful and fair treatment of the farmers. However, they do not set high requirements to go beyond these basics. While the requirements broadly regulate the minimum of shares smallholder farmers are entitled to receive, they leave much room for the exact distribution, which can be taken advantage of to make profits from someone else's efforts. Depending on the project's overall goal, farmers can potentially be treated unfairly, but also be recognized as valuable stakeholders to the goal and compensated as generously as possible. Furthermore, the legal documents are set up by the project developer with little involvement of the stakeholders, leaving little room for discussion when signing the contract. Only a few projects actively recognize the community and treat them fairly regarding their benefits. The requirement to inform all stakeholders, including farmers, about risks, benefits, and other impacts, does prepare them and establishes a fair ground for signing a contract, but it can be argued that the lack of understanding contributes to a rather unfair environment. The ECOTRUST (2020) project report, for instance, states that the benefits did not occur to the expected extent, leaving the farmer with little compensation for their

efforts, while the case study researching that project experienced concerning conditions for the farmers. Moreover, while some projects allow farmers to exit the agreement at any time, and serve the understanding of a fair contract, others tie them to the project for many years. Projects that implement a project council enable farmers to speak up and raise concerns, which supports justice and fairness. Lastly, some legal requirements are excluding or make it challenging for farmers to enter the VCM with bureaucratic necessities.

To summarize, under the principle of well-being, the VCM can provide benefits such as additional income, education, and environmental benefits from agroforestry practices. However, the income is rather low to compensate for the efforts, is potentially paid late, and causes financial insecurities and dependencies. Results that contribute to or diminish farmers' autonomy were further mentioned, with the main finding being the lack of understanding of smallholder farmers and their rights and the VCM dynamics. Under the principle of justice, it has been discovered that verification standards often set only minimal requirements, and that the outcome therefore differs from each project.

5 Discussion

This chapter compares the most significant findings of Chapter 4 Results with the insights from Chapter 2 Theory and Conceptual Framework. The discussion focuses on remarkable similarities and differences between the empirical findings and theoretical assumptions and explains these observations. The usability of Mepham's matrix – the conceptual framework of this study – is also discussed.

5.1 Empirical Results and Theory

5.1.1 Impacts of the VCM on Smallholder Farmers

The results of Chapter 4 identify that the main motivation for smallholder farmers to join the Voluntary Carbon Market (VCM) is the additional income. The financial incentive is provided by the market structures, with companies preferring to offset their CO_2 emissions cheaply in the Global South instead of reducing their emission through a change in practice (Stolz & Probst, 2024). Participating smallholder farmers, often in a vulnerable position, are drawn to the promise of additional income. Even though the expected payments do not cover the required workload, exposing them to exploitation, scientific literature has a rather positive attitude towards carbon projects, framing them as a win-win. Buyers offsetting their residual emissions, and farmers receiving an additional income (Dawes et al., 2023). Even though stakeholder interviews and documents argue that the non-fiscal benefits need to be considered as part of the compensation, it should be seen critical that possible agroforestry benefits, which will only appear after years, are sufficient to compensate for the shortage of financial compensation.

Adding on to farmers' already existing vulnerable situation, the challenge of communication and market understanding contributes to increasing dependencies not only on the income but also on information, education, and market access. Project developers thus have the power to worsen their situation or to create positive impacts and empower the smallholder farmers. This layer of dependency is rarely discussed in

the literature, generally Shiva (2000) (as cited in Hourdequin, 2024) describes growing dependencies of smallholder farmers with increasing globalization.

Critics have labelled this power of project developers climate colonialism (Táíwò, 2019) , and the data presented in Chapter 4 illustrates these dynamics. Many farmers do not fully grasp the project design and hidden risks, limiting informed decision-making and exposing them to becoming easily influenced. Such ongoing exploitation within the VCM could have severe consequences, not only for the local community but eventually for the global food supply, as smallholder farmers play a crucial role in it (Taherzadeh & Mogollón, 2024). The missing guarantee of the sale of Carbon Removal Units (CRUs) adds to the risks, highlighting the need for proper agroforestry systems implementation and smallholder farmers' education, to ensure non-fiscal benefits are received.

If those things are not taken care of, after twenty to thirty years, the planted trees will no longer serve additional income, leaving the farmers without further financial support but little room to grow food due to possible overcrowding of trees on the farm. In this case, the farmers could potentially find themselves in an extremely exposed situation, receiving no support from the project developer and no further long-term benefits as envisioned in the literature. This shows that the reality is less optimistic than the literature states, and only a few projects may contribute positively to smallholder farmers' lives.

Initiatives that treat farmers with respect, provide education, and ensure fair compensation, like the Rabobank-Acorn project in Peru appears to do based on the interviews, can generate sustainable and positive effects, which can raise curiosity and motivation for more farmers to adopt those practices. The potential of the snowball effect is present when done with the right incentive, providing the potential to integrate sustainable practices among farmers without colonialist dynamics or increased dependencies.

In order to achieve this, farmers and project developers need a holistic understanding of VCM participation and agroforestry. While the literature notes additional social and environmental benefits (FSD, 2025; Kibe et al., 2024; Tumushabe et al., 2023), some fail to stress that the financial compensation alone is insufficient, which could create false perceptions of the VCM dynamics for stakeholders. It overlooks the required planning

and workload behind a proper agroforestry system, possibly leading to the misconception that simply planting trees guarantees benefits and CRUs sales.

Notably, the literature frequently oversimplifies the difficulties smallholder farmers face by concentrating on more general market dynamics rather than real-world problems like late payments, complicated bureaucracy, and intensive agroforestry system implementation. Practical issues are frequently overlooked in theoretical discussions, emphasizing the significant contrast between academic viewpoints and practical reality.

5.1.2 Rights of Smallholder Farmers in the VCM

The effectiveness of certification standards in safeguarding smallholder farmers remains questionable. While standards like Verra (2024) and Plan Vivo (2024) claim to address critical issues, such as ensuring farmers' information, the reality of projects like the Plan Vivo-certified ECOTRUST (2020) initiative uncovers limitations. Conversely, Rabobank-Acorn projects, also Plan Vivo-certified, show better outcomes by respectfully engaging with the farmers. This contrast emphasizes that verification alone doesn't ensure ethical implementation, exposing weaknesses within the verification standards and the implementation of those. Standards may cover rights on paper but fail to address power imbalances in practice, which can create a wrong perception of verified carbon credits, meaning a verification can't automatically be trusted, but depends on the project itself.

The appearance of two projects under the same verification organization with such different values and experiences for farmers highlights that the standards don't address power imbalances and dependencies properly. Accountability is prioritized for buyers seeking credible offsets, not for ensuring farmers' well-being. This supports the wrong perception by signaling credibility to potential buyers but ensuring little protection of the farmers.

Even though standards require transparent communication, farmers still lack meaningful understanding of project terms, VCM structures, and long-term agroforestry benefits. This gap persists even when transparent communication is framed as a right, which is worthless if documents are not provided in the native language, which marks a visible

lack of a farmers-led approach in the standards. As mentioned above, the inability to grasp contextual obligations or market risks leaves them vulnerable to exploitation.

This research reveals that farmers' rights to information, fair compensation, and participation in decision-making are mentioned in the verification standards but leave gaps to actually secure them. As reflects the right to cancel the contract at any time. A look at the circumstances for farmers when deciding to leave the project early shows that high initial investments, extensive workload and partial compensation in long-term benefits. This incentivizes the farmer to stay within the project to the point until benefits are received to make it economically feasible, which can restrict the behavioral freedom to cancel project contracts at any time.

5.1.3 Ethical Considerations

While companies can easily achieve their goal of offsetting emissions by simply buying the carbon credits, the creation of these requires a high workload for smallholder farmers with unstable compensation that will mostly be received in the long term. This reflects unequal consideration of efforts within the market of the participating parties.

Despite the growing importance of the VCM, the literature misses ethical analysis specifically focused on smallholder participation. While the academic field critiques the market structures it rarely considers detailed impacts on smallholder farmers.

Taking a utilitarian perspective, the discussion should stress whether the participation in the VCM does more harm than benefits for stallholder farmers (Markkula Center for Applied Ethics at Santa Clara University, 2024). Since it has been discovered that the impact on smallholder farmers heavily depends on the project, this assessment needs to be done for the respective project individually. Nevertheless, for the analyzed projects, the main issues identified (created dependencies, potential economic insecurities, lack of information provided to the farmers, and the use of power imbalances) could possibly outweigh the project's benefits. For smallholder farmers, it seems impossible to identify if projects might offer more benefits than harm and whether it can be trusted or not beforehand, exposing them to possible exploitative initiatives since the balance of harm and benefits appears not to be secured in all VCM projects yet.

The second ethical theory, Kantianism, can be used to discuss whether smallholder farmers are treated as ends in themselves or as means (Food Ethics Council, n.d.). As mentioned in Chapter 4, the financial incentive will disappear after twenty to thirty years of participation, which was the main motivation for the farmers. This shows that farmers are a consumable item in the VCM system, used to create CRUs for the given time. After this period, depending on the projects, farmers either have a well-working agroforestry system that will provide them with benefits for a long time, or will face additional issues transforming back to agricultural practices. By that time, the carbon credits have already served their purpose and depending on the value of the project, farmers can be set aside since no CRUs are being created anymore. This is also integrated into the standards, focusing on accountability and maximizing credits rather than the farmers' well-being, highlighting the lack of respect farmers are viewed with. Furthermore, the missing transparency, information, and understanding make it impossible for farmers to thoroughly consider decisions, which contradicts the principles of Kantianism that a proper foundation of decision-making should be provided, and decisions should not be influenced. Long-term contracts also undermine Kantian values by limiting farmers' autonomy within those years and the possibility to step out of the project at a later point, which could be reinforced by Solidaridad's idea of providing loans to smallholder farmers. Taking a Kantian perspective, the question remains whether the VCM treats farmers as rational beings who deserve respect and transparency.

Lastly, Rawlsians' theory of justice calls for the perspective of rational individuals and whether they would accept the circumstances as fair (Food Ethics Council, n.d.; Velasquez et al., 2014). Within the VCM, the people most affected by the negative consequences are the ones with the least power. A fair system includes the farmers' voices, which is written to be the case in project reports, but again the practice seems to differ. Furthermore, it should be seen critically that the distribution of shares shrinks for smallholder farmers because of the rising bureaucratic hurdles. The ones that already receive too little financial compensation for their efforts are carrying the market flaws. Though organizations that provide VCM access to smallholder farmers need to cover their operational costs and a change in the value of carbon credits is limited by marked dynamics, highlighting that wealthier countries are in position of more power.

Furthermore, it is questionable whether it's justifiable that farmers have to wait many years to receive the full compensation in the form of agroforestry benefits. Especially because the payments from the CRUs sale don't cover the initial expenses. The delay of parts of the compensation creates an unfair burden on the most vulnerable who invest time, effort, and their land with uncertain long-term returns.

The ethical dilemma is intensified by insufficient autonomy, making farmers more likely to accept unfavorable terms, maintaining cycles of dependency and exploitation. This underlines the concern of "climate colonialism" (Wang, 2021). The lack of detailed ethical analysis in the literature leaves these inequalities largely unaddressed, with market mechanisms prioritizing the interests of buyers and carbon credit quality over the rights and dignity of the farmers, the one who actually contribute to climate mitigation. The impact of the current VCM structures raises fundamental ethical questions about fairness, autonomy, and justice for smallholder farmers.

5.2 Reflection on Mepham's Matrix

Mepham's matrix, as a conceptual framework, provided a valuable tool for this thesis, offering a structured ethical lens based on common ethical theories. Aligning the empirical findings with the principles of well-being, autonomy, and justice allowed an analysis of smallholder farmers' participation in the VCM and its impacts. The stakeholder-centered approach effectively highlighted ethical tensions, such as the gap between formal autonomy and actual powerlessness, or between theoretical justice and limited benefit-sharing.

While the matrix simplified complex ethical issues and improved analytical depth, it also required subjective interpretation, especially when applying abstract principles to real-world contexts. Weighing ethical trade-offs across the three principles proved challenging, as they can conflict with one another and do not always provide clear guidance on how to prioritize competing ethical claims, as Mepham (2000) states. Moreover, the framework's structure, though helpful, risked oversimplifying complex systemic power dynamics, such as climate colonialism, which goes beyond interpersonal ethics and demands broader structural analysis.

Furthermore, while morality involves identifying standards for decision-making, this thesis did not fully undertake that systematic moral reasoning due to the limited research scope. The matrix's reliance on Western ethical theories also raises concerns about cultural applicability, particularly when assessing projects in the Global South. Despite these limitations, the framework facilitated a meaningful ethical evaluation and underlined the need for more robust, justice-oriented governance in the VCM.

6 Conclusion

6.1 Recap of the Thesis

This thesis aimed to identify the impact of the Voluntary Carbon Market (VCM) on smallholder farmers and assess it from an ethical perspective, providing a new viewpoint in VCM participation. Initially, an overview of the VCM, including its purpose, aims, and functions, was provided with a brief description of its key actors and their respective tasks. The relevance of the study and contribution to the scientific field was described as outlined by the objectives of the thesis. The literature review was further used to gain insights into smallholder farmer participation in the VCM and its already identified benefits and challenges (RQ 1), as well as to identify existing rights and legal procedures (RQ 2).

Both interviews and document analysis provided valuable insights on the impact on smallholder farmers participating in the VCM (RQ 1), and documents, including standards and project reports, allowed the assessment of the rights that are in practice in VCM projects (RQ 2), contributing to the fulfillment of the research objectives. To include the ethical viewpoint, Mepham's matrix, as a conceptual framework, was incorporated and allowed the analysis of the findings with three major theories: Utilitarianism, Kantianism, and the Rawlsian theory (RQ 3), which contributed to the initial goal to look at the identified impact from an ethical perspective.

The stakeholder interviews and the document analysis contributed to answering RQ 1 and RQ 2. RQ 3 was attempted to answer; however, stating whether a specific impact or the sum of impacts is ethically justifiable requires further investigation and more detailed information on the effects and a definition of moral norms. Nonetheless, an ethical conversation about the impacts smallholder farmers face and the rights they hold was provided to start the conversation. Therefore, the research objectives have been partly achieved, lacking a more in-depth ethical analysis and its place in social constructs.

6.2 Answer to the Research Questions

This section answers the research questions, where RQ 1 aimed to identify the (direct) impacts of the VCM on smallholder farmers. RQ 2 aimed to detect the rights that smallholder farmers hold when participating in the VCM, whereas for RQ 3, the conceptual framework was used by applying ethical theories to the findings and analyzing them from an ethical perspective, aiming to determine whether those are justified or not.

6.2.1 Research Question 1

Participation in the VCM offers smallholder farmers additional income through the sale of carbon credits. But this financial compensation does not cover the efforts of farmers to sequester carbon. On top of the income, non-fiscal benefits like access to agroforestry training, possible higher crop quality, and increased climate resilience can emerge. However, challenges like complex bureaucracy, initial crop loss, and the risk of exploitation due to a lack of understanding of the market exist. The impact on smallholder farmers' experience when participating in the VCM varies and relies on the project where some projects provide support and clear communication, others fail to do so, leading to false agroforestry implementation or even the abandonment of agricultural practices to maximize the carbon credit sale, resulting in insufficient income and worsening farmers economic situation, especially when payments are delayed. Farmers' vulnerable position and dependence on income and project developers make them highly exposed to exploitation.

Agroforestry can have several positive effects on farmers, agricultural practices, and the community when properly executed. However, without guidance and understanding of the VCM dynamics, participation may harm farmers more. The negative outcomes are dependent on communication, education, and farmers' knowledge.

6.2.1 Research Question 2

By joining VCM projects, farmers must provide free, prior, and informed consent (FPIC), and they hold basic human and property rights, which are required to be covered by the verification standards of Verra and Plan Vivo. Farmers have the right to clear

communication, including potential risks and benefits, obligations, and benefit-sharing. Yet, in practice, farmers are not fully aware of their rights, making them even more vulnerable to exploitation. Not all projects prioritize transparent and clear communication, and have little effort to overcome the language barrier, which often makes important documents inaccessible. Furthermore, verification standards require monitoring mechanisms and stakeholder engagement, but the execution differs a lot depending on the project. While some projects implement a project council for farmers' representation, their autonomy is limited by power imbalances and economic vulnerability.

Although basic human rights and further requirements to ensure ethical practices are part of standards like Verra and Plan Vivo, the actual fairness of benefit-sharing and decision-making heavily depends on the values of individual projects.

6.2.1 Research Question 3

When analyzing the VCM with Mepham's matrix, it becomes clear that carbon projects have the potential to improve smallholder farmers' well-being through additional income and agroforestry benefits, but these benefits hold short-term and long-term risks.

From a utilitarian perspective, the balance of benefits and harm depends on the context. While some ensure farmers' well-being and aim to maximize the benefits the VCM and agroforestry have to offer, others hold serious economic and social risks, mainly when support and education are missing, and delayed payments intensify those risks.

Viewing the impacts from a Kantian ethics perspective, the autonomy of farmers can be questioned by the limited understanding of the VCM and agroforestry practices, leading to uninformed decisions that weaken true voluntary participation, existing power imbalances, and dependencies.

Ethical concerns further arise when applying Rawlsian justice, focusing on fairness. Often, farmers face more risks than benefits and are in a position of little power to negotiate better terms. Although the verification standards are meant to ensure fair treatment and protect farmers' rights, the proper application and actual protection of farmers depend heavily on the project. True justice requires not only the recognition of

rights on paper but also their realization in practice, through meaningful inclusion and fair distribution.

To conclude, the impacts of the VCM have the potential of being ethically justifiable, depending less on formal requirements but on the project's values and commitment to empowering smallholder farmers. So far, the impacts of most analyzed projects raise fundamental ethical questions about fairness, autonomy, and justice for smallholder farmers.

6.3 Recommendations for Actors in the VCM

To ensure meaningful participation of smallholder farmers in VCM projects and escape the colonialists' practices as described by Wang (2021), the mindset of project developers and intermediaries needs to shift from a profit-focused approach to a sustainable, long-term innovation point of view that applies a farmer-led approach (Pan et al., 2022). With the right values practised in the projects, farmers can largely benefit from VCM participation. This includes supporting long-term agroforestry transitions with technical assistance, monitoring and necessary education, which could be embedded in verification standards.

Moreover, the supervision of intermediaries should be strengthened to prevent further exploitation and ensure fair benefit-sharing. Standards should implement consequences when requirements are not met and prioritize farmer-led monitoring. Without such changes, verifications risk becoming more of a marketing tool for corporations rather than safeguard quality and participants.

As noted by Barbato & Strong (2023) and Tumushabe et al. (2023), addressing the challenge of bureaucratic barriers and administrative costs can enhance the share of benefits, maximize profits for smallholder farmers, and facilitate easier access to the market for those participating in the VCM. Overall, participatory project designs that meaningfully include farmers and focus on equity and transparency while empowering participants should be encouraged.

6.4 Reflection on Limitations

The following limitations of this thesis have to be recognized: while the analyzed documents and conducted interviews provided adequate information to answer the research questions, access to a wider range of projects would enhance the validity of the results and provide a wider view of the market dynamics on smallholder farmers. This was limited by very few responses from potential interviewees, as well as inaccessible project documents. The results of the analyzed project reports have to be handled with caution, as K & Kamukama (n.d.) case study shows, that statements in the reports are not necessarily the reality. Furthermore, farmers themselves were not able to be included in the research, which would contribute largely to identifying further implications and their effects. Moreover, the ethical theories were applied simplistically and can be used for a more in-depth and detailed analysis. Lastly, a potential bias due to the qualitative nature of interviews and document analysis has to be considered.

6.5 Recommendations for Future Research

To increase the knowledge about the impact on smallholder farmers participating in the VCM studies of VCM projects across different types of farming and with different project developers can be conducted. Tracking the livelihood, well-being, and autonomy of farmers in VCM projects over time can contribute to the assessment of the ethical justification of the impacts, since most of them will only appear after years of participation. Furthermore, alternative models for farmer participation and benefit-sharing in the VCM could be examined to analyze whether there are more beneficial practices that have the potential to reduce dependencies and exploitation. Lastly, an analysis of the effectiveness of the VCM standards in protecting smallholder farmers could be conducted and how it can be strengthened to increase the safeguarding of smallholder farmers within the VCM.

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8 Appendices

Appendix A

Questionnaire Interview 1

- Could you briefly introduce yourself and your role at Solidaridad?
- How is Solidaridad involved in VCM projects?
- What are the most important goals and activities of the projects of Solidaridad?

1) How are smallholder farmers informed about the project?
2) What are the reasons/motivations for smallholder farmers to participate in the project?
3) What are the challenges and benefits for farmers to participate?
    - How do smallholder farmers perceive the benefits of participating?
    - Have there been any unintended or negative consequences for farmers or their communities as a result of participation?
    - How would you say power imbalances appear within the VCM for smallholder farmers?
4) Have you observed any change in the livelihoods of participating smallholder farmers since the project's implementation? (If yes, what?) (income, economic stability, overall livelihood)?
    - What are the impacts on the community of participating in the VCM (collaboration, group benefits)?
5) Is the impact of the project on smallholder farmers evaluated? (If yes, what, and how is this done?)
6) When farmers want to participate in the project, do they have to sign a contract/agreement? Can you describe the contract/agreement?

7) What rights and obligations do smallholder farmers have when participating in such a project?
8) How are farmers informed about their rights and obligations within the project?
    - Are there mechanisms/procedures to ensure transparency, inform the participants and avoid unfair practices (workshops, info flyers, trainings, etc.)?
9) How does the project address possible ethical issues, such as power imbalances, exploitation and dependencies of smallholder farmers on other actors such as project developers and corporate buyers?
10) In your opinion, are there any ethical concerns within this kind of carbon-farming projects?
11) Will the current approach of carbo-farming projects under the VCM result in sustainability for smallholder farmers? Also in the long term?
12) How do you see the future role of smallholder farmers within carbon markets?

Questionnaire Interview 2

- Could you briefly introduce yourself and your role at Solidaridad?

1) What is the reason/motivation for smallholder farmers to participate in a VCM project?
2) Apart from the agricultural benefits, what are the challenges and benefits for farmers from participating in the VCM?
3) Have there been any unintended or negative consequences for farmers or their communities as a result of participation?
    - How would you say power imbalances appear within the VCM for smallholder farmers?

- How is the community affected by SHF participating in the VCM?

4) Have you observed any change in the livelihoods of participating smallholder farmers since the project's implementation? (If yes, what?) (income, economic stability, overall livelihood)?
   - What are the impacts on the community of participating in the VCM (collaboration, group benefits)?
5) Is the impact of the project on smallholder farmers evaluated? (If yes, what, and how is this done?)
6) How do farmers view the financial compensation compared to the efforts they have to implement agroforestry?
   - Literature states too little compensation for high efforts.
7) Does the market incentivise farmers to plant more trees than what would be good for agricultural benefits?
8) How does the project address possible ethical issues, such as power imbalances, exploitation and dependencies of smallholder farmers on other actors such as project developers and corporate buyers?
9) In your opinion, are there any ethical concerns within these kinds of carbon-farming projects?
10) Will the current approach of carbon-farming projects under the VCM result in sustainability for smallholder farmers? Also in the long term?
    - How do you see the future role of smallholder farmers within carbon markets?

Appendix B

Category	Code
Smallholder participation in VCM	
	Tranfering to forestry due to project intervention
	Payments
	Money as incentive to plant trees
	First payment will cover costs for next years agroforestry
	Farming more benficial than forestry
	Farmers in VCM System
	Farmer participation in future
	Family involved in Agriculture and VCM
	Education most important for long-term success
Indirect impact VCM	
	Payments influence social cultural dynamics, gender roles, availability of inputs and knowledge
	Negative impact on communities
	Legal Framework for big projects
	Landuse would change without carbon finance & project interventions
	Increased livelihood
	High operational costs for project developer
	Farmers value trees
	Excluding women
	CRUs incentive to adopt sustainable practices
	Change of livelihood
	Bureaucracy slowing down the process
	Agroforestry reducing soil erosion
	"reduced deforestation and biodiversity loss"
Direct impacts VCM	
	Reuction in input costs

	Resilience to climate change
	Reduction of poverty through carbon projects
	Productivity stabilizes on first years
	Nutritional variety
	Not informing farmers enough
	Low payments but additional farming benefits
	Increased productivity
	Increased food security
	Challenges for Agroforestry
	"ensuring fair and sustainable market (...) for farmers"
Costs VCM	
	Purchase of seedlings to expensive without Local Partner
	Productivity loss in first years
	No guarantee for sale of CRUs
	Investment in trees
Challenges VCM	
	Women not involved in decision
	Unsecure financial return at project beginning
	Productivity goes down caused by climate change
	Payments are delayed
	Payment doesn not cover costs
	No production overview
	Limited payment methods
	Lack of projects for farmers to accsess VCM
	Lack of communication
	Income insufficient
	Few farmer have official land title
	Farmers want to plant more trees to recive more income
	Farmers face food insecurities

	Farmers dont have financial means to implement agroforestry
	Exploitation
	Delays causeing debt of farmers
	CRUs creation only short-term
	Costs restricting farmers to implement agroforestry
	Complicated verification process
	Bureaucracy
	Bigger projects work differnet than smaller
	Benefits wont be seen in the short term
	"did not receive expected payments"
Benefits VCM	
	Training for agroforestry
	Training farmers to use trees, not cut them down
	Support transitioning to agroforestry
	Revenue creates buffer for harder times
	No fee to participate in projects
	Monitoring of farmers productivity
	Income
	Help for initial investment in trees
	Farmers becoming leaders in commuity
	Empowering women
	Empowering farmers
	Education for farmers
	CRUs segnificant revenue source for local community
	Construction of storing and processing facilities by project
	Compensation for efforts
	Co-benefits from CRUs sales for farmers
	Bureaucracy handled by Project
	Better quality Coffee

	Benefits of Agroforestry
	Access to infrastructure
	"Solidaridad baring the costs"
Rights of farmers	
	VCS ensuring property rights are respected
	VCS ensuring no forced labor, child labor, etc.
	VCS ensuring no discrimination or sexual harassment
	VCS ensuring human rights are respected
	VCS ensuring equal opportunities (gender/participation)
	Structure of Payment
	Stakeholder meeting including all farmers
	Risks, costs & benefits to stakeholder need to be communicated
	Revenue-sharing system
	Responsibility to "Respect and compliance with rules"
	Responsibilities of Solidaridad
	Property rights must be respected
	Project will not interfere with farmers property
	Project proponent must establish communication strategy to enable stakeholder to raise concerns
	Project must assess economic, social, cultural and environmental impact
	Project must not negatively impact environement or community
	Project must identify negative impact and mitigate them
	Project must identify & mitigate risks towards well-being
	Participant Agreement
	Monitoring plan for roles and responsibilities required
	Mitigate risks towards women and children
	Long-term Benefits beyond CRUs sale
	Local representatives in project design

	Land title
	Inclusion of stakeholder in project design required
	Human rights
	End of Agreement at any time
	Distribution of CRUs revenue signed in local partner contract
	Consent Form
	Carbon credit ownership rights with project proponent
	Benefit sharing plan
	Benefit Sharing Mechanism
	Benefit sharing agreement in a culturally appropriate manner
	Bariers to stakeholder engagement must be addressed
Farmers Responsibility	
	Responsible for keeping CO2 emissions low
	Responsibility to plant and take care of trees
	Responsibilities of farmers
	Provide information to local partner
	Keep trees planted for 25 years
Respect for well-being	
	VCM Project causing harm
	Support from the project
	Stakeholder analysis must include expected changes in well-being
	Project goal pro-farmers
	Project causing more harm than benefits
	Monitoring of farmers' well-being not considered
	Including Farmers needs and feedback
	How farmers are involved depends on project
	Ensuring experienced team members
	Baseline Scenario for livelyhood

	Aktive risk management safeguarding wellbeing
	"facing economic hardship and food insecurity"
Respect for justice	
	Transparency of project developer
	Tied to contract
	Stakeholders feedback musst be evaluated from project developer
	Requirements to access project
	Relevant laws covering workers rights need to be included
	Monitoring of SDGs but not farmers' well-being explicit
	Monitoring of project required
	Long contracts
	Local Partner decides about distribution of income
	Local community involved in project at operational level
	Farmers participating in project council
	Ensuring no displacement of populations
	Compensation no amount specified, open for interpretation
Respect for autonomy	
	Trust in projects
	Relatable project name
	Recognizing local communities
	Project sensitive to possible ethical issues
	Project intervention carried out only by residents
	Producers voluntarily join VCM
	Possibility to voice concerns and challenges
	Good communication with farmers
	FPIC
	Farmers want to exit project if they could
	Farmers Understanding
	False promises

	Contract not in native language
	Agreement doesn’t provide important information
	"Producers are the ones who take the final decision"
Other codes	
	Stating positive outcome of project
	Reserve CRU without payment
	Recommendation for tree density
	Not recognizing nature of local economies
	Monitoring of Livelihood
	Farmers failing targets
	Ethical consideration
	Different recommendation for tree density
	Contracts linked to performance goals

Declaration of Academic Integrity

Official statement of original thesis

By signing this statement, I hereby acknowledge the submitted thesis (hereafter mentioned as “product”), titled: “Ethical considerations regarding the impact of the Voluntary Carbon Market on smallholder farmers in the Global South” 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.

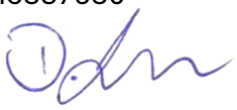
Place: Maastricht, Netherlands

Date: June 20th, 2025

First and last name: Dunja Lange

Study program: MSc Sustainability Science, Policy, and Society

ID number: i6387950

Signature: 

Sustainable Development Goals (SDG) Statement

Name:	Dunja Lange
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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 Codes: 1, 8, 10

Explanation:

This thesis contributes to the SDG 1 (No poverty) by examining the VCM as an income opportunity for smallholder farmers and critically discussing its risks for exploitation and increased dependencies for the vulnerable target group. Furthermore, SDG 8 (Decent work and economic growth) will be addressed with the focus on agroforestry practice and discussing the compensation for the efforts for carbon sequestration as part of the VCM, examining how the market dynamics may support exploitative labor. Lastly, by addressing climate colonialism and power imbalances, inequalities are identified and analyzed, contributing to SDG 10 (Reduced inequalities).

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 access articles and academic literature faster and assess whether it's relevancy Language assistant: Grammarly, Quillbot; improving spelling, grammar, and sentence structure as well as rephrasing ideas for clear formulation Other: Document check and writing support; Perplexity, ChatGPT; providing quick explanations, showing areas of improvement in terms of writing, structure, and content 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.

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