THE IMPACT OF SUSTAINABILITY PRACTICES ON COFFEE VALUE CHAIN IN ELGON REGION, BUGISU CORPORATIVE UNION MBALE, UGANDA

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A DISSERTATION SUBMITTED TO THE SCHOOL OF BUSINESS IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF BACHELOR OF BUSINESS ADMINISTRATION OF UGANDA CHRISTIAN UNIVERSITY

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DECLARATION.

I, Wanzala Alex, do hereby declare that this contention with the title: The impact of sustainability practices on coffee value chain in Elgon region, Bugisu Corporative Union Mbale, Uganda is my original work and has not been submitted for any degree or diploma in any university or any other institution. As much as possible within my understanding, all the sources used or quoted in the work have been duly acknowledged with full references.

Signed: .....

Date: 10/04/2026.....

APPROVAL

I certify that this dissertation titled "The Impact of Sustainability Practices on the Coffee Value Chain in the Elgon Region, A Case Study of Bugisu Cooperative Union, Mbale" has been prepared under my supervision and is ready for submission with my approval

Name: Ms. Lorine Akinyi

Signature: .....

Date: 10/04/2026.

DEDICATION.

I dedicate my dissertation to my beloved parents, Mr. Shimon Perez and Mrs. Nabuloli Jenipher, for their unconditional love, sacrifices, prayers, and encouragement. My parents' belief in my potential has given me strength to persevere through every challenge and remain focused on my academic goals. In addition, I dedicate my dissertation to my dear brothers and sisters and my friends, especially Ms. Nanzala Martha, who have been a constant source of encouragement and motivation. Finally, I dedicate my dissertation to the smallholder coffee farmers of Elgon, who have been a constant source of encouragement and motivation. The smallholder coffee farmers of Elgon are a symbol of hope for a greener, more sustainable, and prosperous Uganda. They are a constant reminder of what Uganda would be if every Ugandan practiced sustainable farming methods. Indeed, their dedication and hard work in practicing sustainable.

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Above all else, I want to express my deepest sense of gratitude to the Almighty God who is the source of my existence, wisdom, and power. I have had the constant company of His eternal love, mercy, and guidance during each and every one of my challenges, doubts, and countless hours of hard work. All these efforts were made possible through his divine grace. It is with the blessings of the Almighty that this dissertation has been achieved, and hence I dedicate this research to him.

In addition, I want to express my sincere appreciation to my dear parents, Mr. Shimon Perez and Mrs. Nabuloli Jenipher. Words cannot explain how thankful I am for all the sacrifice, prayers, and endless support that you showered on me. You are my shelter, light, and wings. It is because of your unconditional support and belief in my aspirations that this accomplishment has been possible. Truly, you are my greatest blessing in life.

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ABSTRACT.

This study sought to investigate the effect of sustainability practices on the coffee value chain in the Elgon Region of Uganda, with special reference to Bugisu Cooperative Union in Mbale District. The study was guided by objectives that included an examination of the effect of sustainability practices on the performance of the coffee value chain.

The study used a descriptive research design with both qualitative and quantitative aspects. The study targeted small-scale coffee farmers who were members of the cooperative union. The study was based on the assumption that sustainability practices such as the use of agroforestry, shade trees, reduction of chemical use, fair trade practices, and farmer participation were important in improving the performance of the coffee value chain.

The study found that sustainability practices have a positive effect on the performance of the coffee value chain. For instance, the study found that agroforestry practices improved the fertility of the soil. The study also found that farmer participation was important in improving the performance of the coffee value chain.

The study concluded that sustainability practices were important in improving the performance of the coffee value chain. The study recommends that sustainability practices should be encouraged in the coffee value chain in Bugisu Region. The study further recommends that the government should establish training centres for small-scale coffee farmers to enhance their understanding of sustainability practices.

LIST OF ABBREVIATIONS AND ACRYOMNS

Abbreviation/Acronym	Full Meaning
4C	Common Code for the Coffee Community
BCU	Bugisu Cooperative Union
CAFE Practices	Starbucks' Coffee and Farmer Equity Practices
FAO	Food and Agriculture Organization (of the United Nations)
ILO	International Labour Organization
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries (Uganda)
PGCS	Primary Growers' Cooperative Societies
UCDA	Uganda Coffee Development Authority
UTZ	UTZ Certified (sustainability standard; now part of Rainforest Alliance)
VSS	Voluntary Sustainability Standards

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CHAPTER ONE

INTRODUCTION

1.0 Introduction.

This chapter is comprised of the background of the study, statement of the problem, purpose of the study, objective of the study, research question, scope of the study, significancy of the study, and imitation of the study.

1.1 Background of the study

The importance of the sustainability practices in the coffee industry cannot be overstated, and this is based on the insights from FAO (2025). Coffee is one commodity that holds a preeminent position in the global scene as one of the most traded agricultural products with market value running into tens of billions of dollars. More importantly, it is a vital lifeline for 20 to 25 million families across the world, particularly in developing nations. In Uganda alone, the coffee industry is responsible for employing 12.5 million people, as highlighted in ILO (2024).

The classic coffee value chain can be identified as one that clearly defines a difference between functionality and geography. This means that whereas the early phases of production, harvesting, and wet milling are highly labor intensive and carried out in labor-abundant developing nations such as Uganda, the later phases of roasting, packaging, and marketing are highly capital intensive and conducted in developed industrialized nations such as the United Kingdom. This disparity within the value chain has always led to numerous negative externalities that include sustainable agricultural activities, ecological disturbances like soil erosion and deforestation, but more importantly, social vulnerability (Kessler & Tokle, 2024).

As has been analyzed by Edwards Jone & Haggar, et al. (2017), the global value chain of coffee production is characterized by a problem of considerable urgency. The authors note that the contribution of coffee production to greenhouse gas emissions creates a direct relationship between the long-term viability of coffee as a crop and the problems of climate change and global warming. The intricacy of this issue, such that it defies simple solutions, creates a scenario wherein the long-term viability of coffee is characterized as a 'wicked problem.' As such, owing to a heightened degree of regulatory scrutiny and shifting consumer behavior, there is a heightened demand for integrity within the global market, such that sustainability standards are increasingly being systematically incorporated into the value chain in order to ensure long term viability (Canwat, 2022).

The key transformative element in this value chain is facilitated by the prevalence of Voluntary Sustainability Standards (VSS), which are seen to act as tools for enhancing social, economic, and environmental conditions in coffee production value chains (van der Werff, 2013). These standards comprise prominent public standards like Fair Trade and UTZ Certified, as well as important private standards like Starbucks' CAFE Practices, which set out specific guidelines to force compliance with specific protocols in three different macro categories of practice.

Rodríguez Guevara et al. (2024) posits that in order to attain higher levels of sustainability in coffee production, it is necessary to integrate three key components, which can be achieved through implementing sustainable production technology and processes to minimize environmental impacts and maximize coffee quality while strategically capitalizing on coffee to attain long-term economic viability through consumer behavior and value addition to coffee production. The overarching aim for implementing VSS is to attain significant benefits, as highlighted in various studies by van der Werff (2013).

This is clearly seen in the structure of Fair Trade, which is intended to offer a full range of support for the farmer. In particular, the standard is intended to ensure that the farmer receives a non-negotiable minimum price as well as a price premium, while at the same time enforcing the core social rights of the farmer and offering the farmer targeted technical training that is intended to mitigate the environmental impacts. In the same vein, the CAFE Practices as a private standard is intended to ensure support for the producers, economic transparency, as well as full traceability. In particular, van der Werff (2013) points out a particular requirement for the observance of sustainability, which is the observance of the social rights, and the market outcome is a higher price than is the case in the conventional trade. In addition to this, Ponte, S. (2009) alongside van der Werff (2013) points out that the presence of complementary initiatives such as the 4C, which is the Common Code for the Coffee Community, is a pointer to the fact that the industry is committed to developing a core baseline for a sustainable supply chain.

The result from a study by Jeroen Van Wijk (2013) points out the fact that the choice to comply with the VSS is not a simple one since it is a move that will alter the governance structure of the coffee value chain. It clearly separates transactional relationships from purely spot market driven interactions toward more collaborative and regulated forms thereby creating significant upgrading possibilities for compliant producers.

This change is financially related to changes in the consumer's perception of the product, especially in developed countries such as Sweden, where consumers feel socially responsible and have a sense of justice when it comes to the proper compensation of the coffee growers.
The different findings of Rodríguez et al. (2024) show an increasing consumer awareness resulting in a real willingness to pay extra money for a specialty coffee that is ethically and ecologically certified, since such a type of coffee costs more because of the certification process and using advanced farming methods.
VSS calls for a multi-dimensional solution that implies the use of technology at the production level, for example, in controlling pests and managing water resources, and aligning the quality of the production with the needs of the consumer to get additional value.
The Mount Elgon area is the geographical heartland of the Arabica coffee production in Uganda. This country produces some of the most exotic flavors of the Arabica coffee because of the special microclimate and altitude of its production sites.

Bugisu Cooperative Union (BCU) is the key institutional mechanism for the implementation of sustainability practices in the region. BCU is an institutional structure for the implementation of sustainability practices that was originally established as a farmer-led organization with its role being to provide the necessary infrastructure for the certification of its members' production at the level of the individual Primary Growers' Cooperative Societies (PGCS), which number over 300 (ACDI/VOCA, 2018). BCU enables its members to access Voluntary Sustainability Standards (VSS) that would not be financially viable for individual growers owing to high audit costs.

However, it is worth noting that sustainability in the Elgon region extends far beyond just a market need. The region has come to experience environmental challenges over the years, with data indicating that Uganda has lost about 64.3kha of humid forests between 2002 and 2019, with a significant proportion of this loss attributed to the increase in coffee production (Tukwatanise Bonnita, 2023). As a result, current sustainability practices within the BCU framework have focused on "climate smart" agriculture, incorporating "shade grown" practices to ensure that landslides and soil exhaustion, which are common in mountainous terrain, are mitigated.

The current economic environment for coffee production in Elgon has experienced a significant shift, with current reports from the Ministry of agriculture, animal Industry, and fisheries (2025) indicating that coffee export earnings have significantly increased to USD

1.5 billion, with a 152.56% increase in value. This influx of funds has significant implications for ensuring that sustainability practices are effectively translated to ensure that future generations are catered to, with 12 million Ugandans depending on the value chain. As a result, this study aims to investigate the current sustainability practices within Bugisu Cooperative Union and their impact on the value chain.

1.2 Statement of the problem.

The Ugandan coffee industry is an important lifeline for the national economy, which provides the much-needed socioeconomic stability for millions of smallholder households (Bongers et al., 2015). The global coffee value chain is currently facing an increase in challenges that are complex in nature, including an increase in climate variability and market price volatility. As such, there is an urgent need for the widespread adoption of sustainability practices and Voluntary Sustainability Standards such as Fairtrade and UTZ (Van der Werff, 2013). The adoption of these sustainability practices is encouraged based on substantial evidence of their ability to foster climate resilience, agrobiodiversity, and social equity via formal market access and premium payments (Jha et al., 2014). The existence of these advantages provides sustainability practices with an important role in guaranteeing the sustainability and competitive edge of the most important Ugandan agricultural export commodity.

Notwithstanding the robustness of the conceptual framework on which sustainability initiatives are based and the mandates of Voluntary Sustainability Standards, the sustainability outcomes at the level of the producer have been demonstrably heterogeneous and unevenly distributed (Berihun, 2024). In comparative studies conducted on the sustainability outcomes of VSS, it has been a common finding that while the sectoral development outcomes of the value chain are positive, the desired outcomes on the three pillars of sustainability are not uniformly achieved at the level of the smallholder. The empirical studies conducted on the sustainability outcomes of VSS have demonstrated that the outcomes on the pillars of sustainability are more pronounced on the social and environmental pillars than on the critical pillar of economic performance, where the gains are modest, difficult to measure, or not distinguishable between the VSS members and non-members (Canwat, 2022).

The problem addressed in the proposed study is the critical absence of empirical and disaggregated evidence on the net impact of the most commonly adopted sustainability practices on the critical pillars of sustainability within the Uganda coffee value chain dominated by smallholder farmers (Bongers et al., 2015). There is a critical absence of empirical evidence on the net benefits of VSS membership that considers the gains from VSS participation and the costs incurred by the farmers, as well as the outcomes between VSS members and nonmembers within similar production contexts. This lack of specific,

measurable, and comparative data creates ambiguity that constrains key stakeholders including the Uganda Coffee Development Authority (UCDA), cooperatives, and farmers from engaging in evidence-based decision making. Consequently, resources are often allocated inefficiently, and the financial and labor investments required for VSS adoption cannot be adequately justified. This ultimately hinders the optimization of the coffee sector for long term sustainable growth and limits Uganda's capacity to maximize value from its crucial commodity within increasingly sustainability driven global markets (Murphy & Dowding, 2009).

1.3 Purpose of the Study.

The purpose of this study was to evaluate the effect of sustainability practices on coffee production quantities by Bugisu cooperative to the world market

1.4 Objectives of the Study.

The study's aim was

1. To analyse the of effect sustainability practices on the economic viability of smallholder coffee producers in Uganda.
2. To determine the extent to which sustainability practices contribute to ecological stewardship in the Ugandan coffee value chain
3. To evaluate the influence of sustainability practices on the social wellbeing and governance structures for smallholder coffee producers in Uganda

1.5 Research Question.

1. What is the effect of sustainability practices on the economic viability of smallholder coffee producers.
2. How much does sustainability practices contribute to ecological stewardship in the Ugandan coffee value chain.
3. How does sustainability practices influence social wellbeing and governance structures for smallholder coffee producers.

1.6 Scope of the Study.

1.6.1 Subject scope.

The scope of this study focused on empirically assessing the heterogeneous impact of Voluntary sustainability standards (VSS) within the smallholder segment of the Ugandan coffee value chain. And with concentration on the Elgon region plus the efforts of institutions like the Bugisu Cooperative Union. Conceptually, the study was limited to analyzing the VSS

outcomes across the three pillars of sustainability such as economic viability that focus on income, productivity, and profitability without forgetting ecological stewardship which measures the mitigation of deforestation and soil degradation plus social wellbeing which involves assessing social rights and governance.

1.6.2 Geographical scope.

Geographically, the research focused solely on the early stages of the value chain which are more labour-intensive, such as cultivation and wet processing of coffee in the Elgon region, thereby recognizing but specifically leaving out the later stages of the value chain, which are characterized by heavy investments. Temporal scope: The time scope of the study included a definite period to enable thorough analysis of the influence that the VSS have on the inconsistent economic gains.

1.6.3 Time scope of the study

The time frame of the study was from 2005 to 2025, which is a period of twenty years. The purpose of this choice was to enable me for proper examination of the mature results of voluntary sustainable standards and sustainability in Uganda, considering that it corresponds with the duration of operation of the most recent initiatives in national strategies. More importantly, the decade is characterized by a marked economic increase in the export levels up to the $1.5billion level at present despite environmental and economic concerns.

1.7 Significance of the Study.

This research has Significance from three perspective, that is to say institutional significance, economic significance, and academic significance.

The research has institutional significance to institutions as it will provide evidence to institutions. For institutions such as the Uganda Coffee Development Authority (UCDA) and Ministry of Agriculture (MAAIF) at a national level, it will provide evidence on precisely what components of VSS are not delivering economic viability. For regional institutions such as the Bugisu Cooperative Union, it will provide evidence to assist in governance and support systems for its members. Significantly, it will assist in providing evidence to ensure that effective policies are developed to address issues such as mitigating deforestation in Elgon, thereby addressing the national imperative that living today does not destroy tomorrow.

The importance of the results for the smallholders is in the direct impact that the results would have on the smallholder farmers themselves, the core of the industry. By creating the processes needed for earning the maximum income from the price premium associated with

VSS, the study will ensure that the farmers can make the correct decisions regarding investments and gain greater leverage within the intricate global value chain. The selection of practices that will allow for maximum production efficiency will have a direct impact on poverty reduction and sustainability for the 12.5 million people of Uganda depending on the industry, which is a clear response to socioeconomic vulnerability.

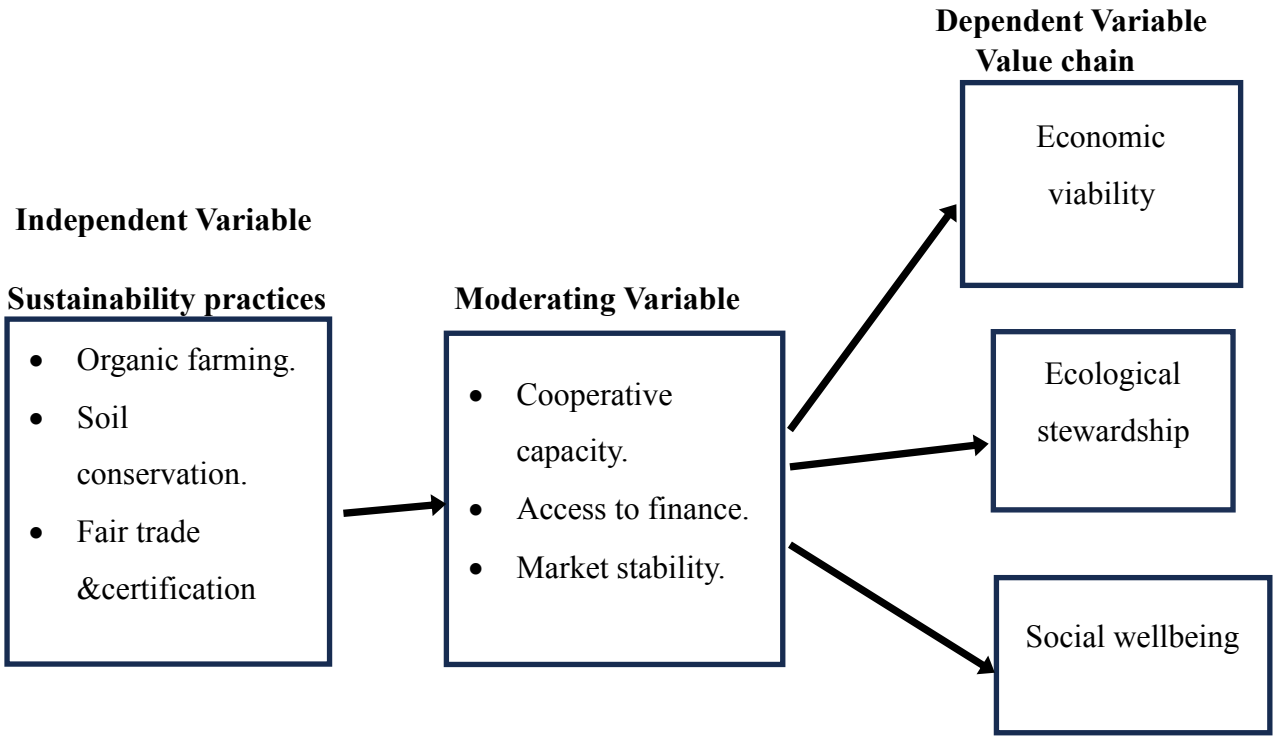
The importance of the findings from the perspective of the scholarly community will involve a notable contribution to the body of knowledge and the sustainability discussion at large. Through employing scientific methodology to demonstrate the cause-and-effect and heterogeneity relations of the VSS system, the project will make a valuable contribution to the debate surrounding the effectiveness of the VSS in agriculture in developing countries. The emphasis on Uganda serves as an important regional example for East Africa. Lastly, the analysis of structural imbalance and extraneous variables such as climate change offers an essential model for managing the "wicked problem" of coffee cultivation, which is relevant to the global supply chain of other complicated goods.

CHAPTER TWO
LITERETURE REVIEW

2.0 Introduction.

This chapter presents the fundamental highlights of the recent research by providing a comprehensive review of existing scholarly work and defining the core analytical frameworks. Initially, the chapter will present the conceptual framework, visually and textually outlining the key variables under investigation and their hypothesized relationships. Following this, the theoretical framework will be detailed which will anchoring the study's central arguments within established academic theories and models thus providing a robust lens for analysis. Finally, a rigorous literature review will explore relevant prior studies synthesizing current knowledge, identifying gaps in the research and establishing the rationale for the present investigation.

2.1 Conceptual Framework.



Source: Adapted from Meemken, E.M &Hunsberger C (2023)

The conceptual framework depicts the relationship between sustainability practices as the independent variable and the coffee value chain as the dependent variable. The implication is that the variables work together in a cohesive manner that determines the output of the sector

(Meemken & Hunsberger, 2023). The relationship is based on the premise that agronomic innovations such as shade grown cultivation and conservation tillage are used as value-adding inputs that enhance the physical and biological structure of the value chain (Rodríguez Guevara et al., 2024).

The use of Voluntary Sustainability Standards (VSS) also introduces critical economic mechanism such as price premiums and minimum price guarantees (van der Werff, 2013). The sustainability practices enhance "value upgrading," which improves the sector from a volume-based commodity system to a value-based specialty system with a focus on ethical integrity (Ponte, 2009). The system improves the financial stability of the sector from the impacts of market fluctuations.

The framework also indicates that the sustainability practices have a significant impact on the dependent variable across the economic, environmental, and social domains. Good social governance, which is addressed through the Bugisu Cooperative Union (BCU), ensures that the benefits of the sustainability practices are equitably distributed (Canwat, 2022).

A symbiosis emerges from the interaction between sustainable processes at the local level and global market dynamics, which makes the sector more stable against the influence of climate change and fluctuating prices. The stability of the sector in the Elgon region is thus guaranteed by its sustainability (Jha et al., 2014).

2.2 Theoretical Framework.

This study was embedded within an integrated and continuous theoretical approach to sustainability within the coffee value chain using the global value chain approach, institutional theory, resource-based theory, and transaction cost economics (DiMaggio & Powell, 2007). The integrated approach is based upon the assumption that the integration of environmental and social sustainability is not an event but an ongoing continuous process that is driven by a continuous feedback loop of external market pressures and internal organizational capabilities (Teece et al., 2010). It was not based upon a simplistic linear cause and effect approach but recognizes the complex nature of sustainability within the agricultural market.

The integrated approach was based upon the assumption that sustainability within the coffee value chain is an ongoing continuous cycle of pressure, adaptation, and outcome (Gereffi et al., 2011). The cycle begins with powerful market actors such as roasters and retailers within a buyer-driven global value chain who apply pressure for quality and sustainability standards

(Ponte, 2012). The standards are based upon Institutional Theory. This acts as a requirement for legitimacy and market access which compels producer organizations to adapt not just for economic efficiency but also for social acceptance from consumers and NGOs. The decision to adopt a tight governance structure such as direct trade is based on TCE theory, which asserts that risks are minimized. It also cuts down costs associated with asset specificity and uncertainty in the supply relationship.

The ability of producers to successfully adapt to these pressures is explained by the RBV, specifically through the lens of dynamic capabilities (Barney, 2017). This theory acknowledges that unique and inimitable resources such as specific microclimates and deep traditional knowledge are crucial. This theory is applicable in this case because it will become a source of superior performance given the ability to innovate, learn, and reconfigure internal and external resources. Sustainability will be viewed as a continuous process of innovation and not merely a set of static practices. Producer organizations such as cooperatives are continually engaged in institutional work, balancing market and sustainability logics to remain viable (Battilana & Dorado, 2010).

Finally, the framework's continuous nature is evident in the feedback loop from performance outcomes back into the system (Ponte & Sturgeon, 2014). The economic, social and environmental outcomes of implemented sustainability practices generate new information that restructures the market, thus potentially creating new institutional norms and demanding further innovation from all value chain actors (North, 2006). Positive outcomes may reinforce the practices and drive increased demand while challenges or inconclusive income effects signal a need for further adaptation (van der Werff, 2013).

In conclusion, this holistic approach was a strong and dynamic tool for analyzing the way sustainable strategies emerge, are managed, and continuously modified in the ever-changing context of the global coffee value chain.

2.3 The effect of sustainability practices on the economic viability of smallholder coffee producers in Uganda.

The global imperative for sustainability in the coffee value chain has significantly altered the economic viability of smallholder coffee farmers, with this effect cascading from global markets down to cooperatives in East Africa, particularly in Uganda’s Mount Elgon region. In this regard, VSS such as Fairtrade and CAFÉ Practices have become essential for smallholder coffee farmers to access high value global supply chains and have become the primary

vehicle for linking sustainable development goals with market functionality (Canwat, 2022). For global buyers, VSS have become non-negotiable since access to coffee is increasingly linked to compliance with VSS standards (Proença et al., 2022). The economics of VSS operate through three channels, which are mutually supporting (van der Werff, 2013). First, there is price protection through guaranteed minimum prices and development premiums. Second, there is governance and risk management through economic transparency and full traceability requirements. Third, specialty coffee premiums are linked to investments in sustainable and high-quality coffee processing methods. Certification promotes good management practices, which in turn should lead to higher yields and quality, thus creating economic surplus to cover costs associated with compliance (Jena, 2015). The supply response for certified coffee is inelastic in the global supply chain, which means that while demand for coffee increases, the supply response for certified coffee is slower, thus maintaining premium prices in the short term at least.

However, translating global sustainability pressures into local realities is a complex task. In Uganda, for example, approximately 80 percent of households are involved in agriculture, with plots averaging less than one hectare (UBOS, 2022). The main target group for sustainability pressures, i.e., smallholder farmers, is affected by different farm practices and their heterogeneity (Bongers et al., 2015). The initial cost of adopting VSS standards, such as upgrading machinery and maintaining detailed records, is a challenge. These costs differ depending on existing farm practices and yield sizes. These problems are worsened by the implementation of new regulations, such as the European Union Regulation on Deforestation free Products (EUDR). This regulation requires geospatial mapping for traceability to ensure no deforestation has occurred after 2020 (European Commission, 2023). This puts up to 98% of smallholder livelihoods at risk, not because they have deforested their land, but because they cannot afford the technology to prove their compliance (Oxfam, 2024).

The potential for a positive economic return, therefore, hinges on factors such as farm productivity and availability of basic requirements such as fertilizers and credit (UNCTAD, 2021).

Moreover, climate change has brought about another layer of costs that go unreimbursed, as small-scale farmers have to contend with insect pests like the coffee berry borer and erratic rainfall patterns, both of which are not adequately covered by VSS premiums (IPCC, 2022). In such a crucial phase for smallholder agriculture, the importance of local institutions cannot

be overstated as they are instrumental in filling the gap of compliance costs for smallholders to take advantage of VSS programs.

The case of the Bugisu Cooperative Union (BCU), established in Uganda's Mount Elgon region in the 1930s to ensure top-quality Arabica coffee supply, is an example that highlights the inescapable connection between the existence of local institutional structures and the economic empowerment of small-scale farmers.

Currently, BCU operates more than 300 primary cooperative growers' societies, which facilitates economies of scale for smallholder farmers in Uganda (ACDI/VOCA, 2018). This considerably reduces the compliance cost for smallholders, making it possible for smallholder farmers to meet VSS standards in Uganda, where certification costs would otherwise be unaffordable (ICO, 2019). Adoption of ethical standards by BCU, as an aspect of social sustainability, results in reputational gains and trust.

This trust enables the cooperative organization to have better and stable terms of trade, especially with ethical buyers, resulting in reduced uncertainty and economic benefit for the members. Centralization of services like provision of inexpensive farm inputs, technical know-how, and financial services makes it easier for the farmers to manage their operational costs and replant in order to increase production (BCU Annual Report, 2023). Despite numerous advantages gained from cooperation, the overall effect on the wellbeing of the farmers has a positive and negative aspect to it. For instance, high internal administrative costs associated with cooperatives limit the remittance of export quality premiums to the farmers (Van Rijsbergen et al., 2016; Fischer & Qaim, 2012).

Whether the benefits from the economic aspect would be positive would depend on whether the premium obtained as a result of productivity and quality would be greater than the cost incurred in complying with the standards, which includes costs such as auditing fees, additional employment costs for documentation purposes, and investments in climate-resistant agricultural practices (Berihun, 2024). In the case of farmers whose yield is relatively low, the overall benefits may not add up due to the relatively high cost of producing the product (Wydra, 2020). The feasibility would depend on the extent to which global consumers are committed to ethical consumption practices, hence showing that the economic benefits realized by farmers rely not only on the collective power of the BCU but also on the effectiveness of the global supply chain in demonstrating social equity factors.

Effective connections between the BCU and the foreign buyers are paramount in terms of ensuring proper and accountable distribution of premiums (Oxfam, 2023). Although sustainable practices are necessary in terms of enabling the survival of smallholder farmers in East Africa in the long run, their associated economic advantages depend on efficient management within the cooperative system and support in terms of incremental monetary rewards that mitigate the cost of compliance in situations where strict guidelines such as the EUDR are mandatory (European Commission, 2023). Ultimately, the future of Mount Elgon coffee is contingent upon the BCU's ability to incorporate externalities and convert them into gains for its members.

2.4 The extent to which sustainability practices contribute to ecological stewardship in the Ugandan coffee value chain.

Sustainability practices within the global coffee chain have increasingly been recognized as vital components for ecological stewardship, thus marking a global shift towards coffee production systems that are more diversified compared to conventional coffee monoculture systems. At the global level, agroforestry systems of shade-grown coffee, integrated pest management techniques, soil and water conservation, and circular waste management practices contribute significantly to biodiversity, soil health, soil erosion, carbon sequestration, and the reduction of greenhouse gas emissions (Springer, 2025). With time, these practices contribute significantly towards building resilience towards climate change.

Although there are challenges with conventional coffee production systems, such as high initial investment costs and a lack of knowledge, conventional coffee production systems have negative ecological consequences, such as deforestation, habitat destruction, soil erosion, water pollution, and high greenhouse gas emissions (Weber, 2011). With the increase in international demand for coffee, coffee production systems have been expanded, thus resulting in deforestation since coffee is often grown on land previously occupied by indigenous vegetation (Petzinger, 2024). This has resulted in an increase in the rate of deforestation, thus posing a threat to biodiversity loss, ecosystem destruction, and extinction of several species of flora and fauna.

This results in the destruction of the necessary tree cover, which is important for carbon sequestration, climatic regulation, and ecological equilibrium. In wet processing, which is one of the common methods, there is considerable water waste production, which could end up contaminating water bodies, harming the aquatic life, and endangering the health of

nearby communities (Mendez & Navarro, 2020). The other environmental problem that occurs due to cocoa production involves the contamination of soil and water by chemicals.

One way out of the problem described above lies in the implementation of environmental sustainability practices along the coffee value chain. Sustainable use of inputs, integrated pest management, organic agriculture practices, and agroforestry are some of the methods recommended for maintaining the ecological balance. More specifically, agroforestry practices have been identified as climate-smart practices that can assist with carbon storage, habitat conservation, and microclimate regulation, thus ensuring the sustainability of coffee cultivation under the influence of climate change (Njuguna et al., 2020). There are several certification programs such as the Rainforest Alliance, Fairtrade, Organic, among others, that support the adoption of environmentally sustainable practices; however, the literature indicates that the effects are highly contingent.

However, despite all these efforts, there is still an absence when it comes to their environmental impact at the farm level, especially where the majority of the systems are dominated by smallholders. The effectiveness of certification and sustainability systems is contingent on the socioeconomic conditions, knowledge of farmers, availability of resources, and enforcement (Petzinger, 2024). While some smallholder coffee farmers have adopted the practice of growing crops under shade or use organic resources for their farming activities due to the presence of market opportunities, others are unable to do so due to economic reasons. There is thus a need to conduct empirical research in evaluating the environmental impact of such practices (Weber, 2017).

In East Africa, scientific studies carried out on diversified farming systems have reflected worldwide trends. For example, diversified farming systems, such as inter-cropping and coffee agroforestry, have proven to be beneficial to soil fertility, biodiversity, and stability of yields irrespective of climatic change (ArXiv, 2024). For coffee farmers in small-scale production, sustainable practices are not merely means of conserving the environment; rather, they are economic survival tactics. The adoption of sustainable coffee production is one of the most significant ways to ensure future survival in agriculture. Therefore, environmental conservation becomes an important component of the Coffee Value Chain.

Nonetheless, there have been an increase of climatic hazards in East Africa like increased temperatures, uncertain rainfall, and pest issues, which are posing threats to the production of coffee and compromising the ecosystem (Celi & Liverman, 2013). These environmental

issues have contributed to deforestation as there is clearance of forest areas to cultivate coffee farms (Njuguna et al., 2020).

Although agroecological coffee production is beneficial to the environment in various ways, such as improving soil quality, conserving biodiversity, and regulating microclimates, it is faced with various challenges based on socioeconomic limitations, land ownership, and lack of awareness (Munyaneza et al., 2021).

At the national level, coffee production in Uganda, which is dominated by small-scale coffee farmers, is a good example of the importance of sustainability practices in coffee production since coffee is Uganda's leading export commodity (National Coffee Research Institute, 2023). The National Coffee Research Institute (NaCORI) and Uganda Coffee Platform (UCP), which are key players in coffee production in Uganda, encourage climate-resilient coffee production, resource-efficient coffee production, and environmentally friendly coffee production in Uganda (Uganda Coffee Platform, 2023).

Agroforestry, which is a traditional coffee production system in which coffee is grown in the shade with food crops, is another practice that promotes ecological responsibility in coffee production since it maintains soil quality, biodiversity, and improving microclimates (Global Coffee Platform, 2023). However, the recent developments in regenerative agriculture and carbon credit programs that encourage farmers to maintain the carbon sequestering coffee system have successfully incorporated the concept of ecological sustainability with the financial well-being of the farmers (ECOTRUST, 2024).

Nevertheless, the level of adoption of sustainable agriculture is still low due to financial constraints, inadequate training, and the lack of proper involvement of farmers in organized groups. Uganda has developed a number of policy frameworks on sustainable land management; however, the level of implementation and enforcement at the grassroots level is still low, which often leads farmers to focus on financial gains rather than sustainability (Mugisha & Mugisha, 2021).

In the Mt. Elgon and Bugisu subregions, the concept of sustainability is closely related to the cultural identity of the farmers and the environmental conditions. The high-altitude Arabica coffee variety is of superior quality and is grown under a shade system of agroforestry that is consistent with global sustainability principles. The farmers practice a system of agroforestry that is beneficial for the conservation of mountain soils and biodiversity. The Bugisu

Cooperative Union (BCU) is a recent development in the region that has successfully incorporated the concept of sustainability in the form of composting the coffee pulp into organic manure, which is beneficial for the fertility of the soil and the reduction of the emission of greenhouse gases from the decomposition of the waste.

These cycles demonstrate how it is possible to achieve positive results for both environmental protection and the economy simultaneously. Nevertheless, it should be noted that there may be some restrictions due to the fact that not all farmers have similar opportunities and resources for implementing these actions constantly. The task of BCU is to facilitate these activities through the promotion of good farming practices, provision of seeds that can withstand harsh climate conditions, encouragement of planting trees, and recycling of nutrients in an organic way. In addition, there is also an important aspect of social sustainability as the involvement of women and young people in the decision-making process regarding coffee farming is also essential.

The empirical assessment of the effectiveness of BCU's initiatives reveals a number of successes but also highlights some limitations. While some farmers can engage in shade management, organic farming, and soil conservation, other farmers face constraints in terms of resource availability, extension activities, and socio-economic factors (Njuguna et al., 2020). The systematic assessment of ecological indicators, including soil fertility, biodiversity, water conservation, and carbon storage, is crucial for assessing performance and developing adaptive responses (Mendez & Navarro, 2020). The participatory approach to research, involving farmers, researchers, and extension officers, guarantees that the environmental indicators will be realistic, relevant, and appropriate when incorporated into local management systems (Hernandez & Pineda, 2022).

Given all these opportunities, the level of contribution of sustainability practices to ecological stewardship in Uganda's coffee value chain remains a challenge due to insufficient financial resources, insufficient labor force, insufficient extension services, and market structures that do not favor or reward sustainability. Trade-offs also exist in sustainability practices. For example, an increase in shade levels may reduce crop yields if not properly managed. Ineffective coordination in Uganda's coffee value chain can also undermine environmentally friendly farm-level practices through carbon-intensive processing or transportation methods. Overall, evidence of sustainability practices in different global, regional, national, and local contexts indicates that when properly executed, sustainability practices significantly enhance

ecological stewardship in Uganda's coffee value chain. Sustainability practices protect soils, conserve biodiversity, recycle resources, combat climate change, and build resilient farming communities. If the process is reinforced by proper institutionalization, incentive structure in the market, and collaboration between organizations like BCU, then sustainable practices could tap into the true potential of the Ugandan coffee production process.

2.5 Impact of Sustainability Practices on Social Wellbeing and Governance for Smallholder Coffee Farmers in Uganda.

From a broader perspective, it is clear from the literature review that there is a consensus on the need for an understanding of agricultural sustainability from a multiscale perspective, starting from theories of sustainability and structural approaches to operational sustainability through cooperatives. The theoretical foundations of the study of sustainability in agriculture are based upon the Sustainable Livelihoods Approach, which focuses upon the interrelationship between assets, vulnerabilities, and institutional structures in understanding household outcomes (Scoones, 2015). Specifically, the Sustainable Coffee Farming Framework (SCFF), which was adapted by Celi & Liverman (2010), applies the Sustainable Livelihoods Approach to the coffee sector by segmenting the coffee farming system into five interrelated components: farmer assets in terms of human, social, financial, physical, and natural capital; the vulnerability context in terms of price variability, climate variability, and sociopolitical instability; transforming structures and processes in terms of governance, cooperatives, and legislation; the strategies adopted by the farmer; and sustainability outcomes. This all-encompassing model recognizes social wellbeing, such as the stability and accessibility of farmer assets, as a key indicator of sustainability performance. It extends beyond simplistic measures such as yield or income. Global studies using this approach have found that there are still underlying structural inequalities within coffee value chains, such as the concentration of power within multinational buyers, smallholders' bargaining power, and equitable access to markets and certification schemes (UtrillaCatalan et al., 2022). These inequalities affect smallholders' capacity to achieve social wellbeing. Therefore, it underscores the need for a combined approach that considers market-based initiatives with inclusive governance and capacity building.

The global coffee value chain has responded to these underlying structural issues through sustainability practices, particularly through certification schemes and voluntary sustainability standards (VSS) such as Fairtrade, UTZ/Rainforest Alliance, and Organic.

Sustainability practices are intended to address environmental sustainability, social wellbeing, and institutional accountability for smallholder coffee producers. Sustainability practices have evolved as a result of changes in international trade, multinational buyers, roasters, and specialty coffee. Multinationals influence smallholder production norms through product quality, ethical sourcing, and sustainability criteria (Raynolds, 2012).

Empirical studies indicate that, though sustainability initiatives offer premium prices, enhance farmers' organization, and encourage transparent governance, these benefits are not equitable and are often conditioned by structural inequalities and local institutional capacities (Valkila, 2009). The social and governance benefits of certification schemes are maximized when cooperatives or farmers' organizations offer training, assist in compliance, strengthen democratic processes, and facilitate collective bargaining (Miyata & Nishikawa, 2019). In contrast, farmers who do not benefit from such organizations often experience exclusion, as certification demands such as traceability, documentation, and minimum production levels may be beyond their capacity (Blackman & Rivera, 2011). In all, the international literature agrees that sustainability practices significantly enhance social wellbeing and governance when embedded in robust and inclusive institutional structures.

Besides certification schemes, other studies have argued that market-led sustainability initiatives are often wanting, as they are embedded in a corporate-led value chain where buyer interests often dominate, undermining smallholder agency (Gereffi & Lee, 2016). Hybrid forms of governance, which incorporate voluntary initiatives, cooperative-led control, and supportive state regulations, are now being promoted as a way of ensuring long-term social and environmental benefits (Loconto & Dankers, 2014). On the other hand, UTZ and Organic certification programs did not lead to comparable impacts. Complementary multi-dimensional analyses, such as the analysis based on the SAFAcompatible SMART Farm Tool (Schader et al., 2016) show that certified farms display better governance and accountability systems as well as participation processes; achieving synergies in the economic, environmental, and social domains simultaneously.

In the case of Uganda, the body of literature shows that informal institutions, social networks, and gender relations play an important role in sustainability adoption processes. In many cases, farmers rely more on clan-related networks, informal lenders, and local organizations than the extension services (Kisamba-Mugerwa, 1998). Such social relations affect farmers' choices regarding sustainability practices. Land tenure problems, such as fragmentation or

lack of formal documentation, can impede the ability of smallholder farmers to engage in agroforestry, certification programs, and sustainable farming practices (Nsimbe & Okia, 2016). Overcoming such structural barriers would be crucial to attain equitable social and governance outcomes.

The importance of cooperatives as facilitators of sustainability initiatives cannot be understated in the case of Uganda. Cooperatives offer financial services, access to extension services, certification, and markets to smallholders. In turn, governance quality defined in terms of transparency, democracy, accountability, and efficacy of leadership is shown to have a strong impact on socio-economic outcomes of cooperatives (Kwapong & Korugyendo, 2010). Good governance leads to better prices, quality assurance, and equitable distribution of profits. Poorly governed cooperatives contribute to elite capture and mistrust, leading to members leaving the cooperatives. Thus, cooperation and capacity-building efforts are crucial in sustaining the benefits of the sustainability programs, emphasizing the significance of governance for social wellbeing (Katungi et al., 2021). Effective governance structures are essential survival factors, especially for female-headed households.

Arabica coffee production is at the heart of livelihood strategies in the Mount Elgon Bugisu region in Uganda. As in other regions in the country, sustainability programs involve complex social relations and governance structures. Although there exists a rich tradition of cooperative based marketing, social inequalities persist in the region, especially gendered inequalities. Despite being actively engaged in coffee farming, which is laborious, many women have little to no say in decision-making processes within households and cooperatives, thereby limiting their potential benefits from better market access and compliance with sustainability requirements (Nansamba & Kamusiime, 2019).

Various structural issues, such as gender disparities in land ownership and lack of access to extension services, also hinder women from assuming leadership roles. However, the ever-growing pressures imposed by voluntary sustainability standards in terms of traceability, documentation, and environmental protection have the potential to exclude marginal farmers without the provision of targeted assistance. Researchers note that failure to implement proactive measures that can tackle the inequalities could lead to sustainability programs being inadvertently used to deepen pre-existing disparities (Meinzen-Dick et al., 2020). Indeed, empirical evidence from the Mt. Elgon area shows that through the incorporation of sustainability programs along with effective governance reforms, which include farmer

education, gender empowerment, and incentives, cooperative members benefit from stable incomes and better-quality products despite weather disturbances (Kikuchi et al., 2018).

The agroforestry systems that have been embraced by farmers living in the hilly and vulnerable areas of Bugisu ensure not only sustainability for the environment but also ensure the sustainability of households, ensuring food security for their members. This relationship is embedded in institutions like the Bugisu Cooperative Union (BCU), which acts as an implementation mechanism of the transformative structures of the SCFF. The ability of BCU to support negotiation, communication, and certification is what enables sustainability initiatives to yield positive impacts through improved social capital, livelihood security, and enhanced smallholder agency (UtrillaCatalan et al., 2022).

CHAPTER THREE

Research Methodology

3.0 Introduction

This chapter describes the research methodology employed in the evaluation of the influence of sustainable practices on the coffee value chain in the Elgon area with particular emphasis on the Bugisu Cooperative Union (BCU). It outlines the research methodology including research design, target population, sampling techniques and data collection techniques.

Primary data was obtained through questionnaires and interviews, as well as secondary data drawn from the records of BCU, UCDA reports and related literature sources, will also be included in the chapter. This methodology will give a description of the tools and instruments utilized during the research process, as well as data analysis techniques and the way results are presented. Ethical issues like consent, confidentiality, and academic integrity are also going to be covered. Through this methodology, opinions of all parties involved in the value chain of coffee have been incorporated.

3.1 Research Design.

This study used the descriptive case study approach, which aimed at evaluating the influence of sustainable practices in the coffee value chain in the context of the BCU cooperative in the Elgon area. The choice of this approach made it possible to provide a description of existing practices in terms of their challenges and outcomes. At the same time, the chosen design provided a deeper insight into the ways in which sustainable practices influenced the economic, ecological, and social aspects of life for smallholder coffee producers. Since the

study focused on the experiences of a particular region and the cooperative in question, the analysis included the voices of farmers, cooperative leaders, extensionists, and BCU management.

3.2 Study Population.

The participants in this research were 120 people and these included important stakeholders in the sustainable practices within the coffee value chain of the Bugisu Cooperative Union (BCU). They comprised of farmers who represented primary cooperative societies, agricultural advisors in extension services, staff at BCU who were involved in management and operation, and community farmers who were small-scale coffee growers practicing sustainable agricultural activities. As per Mark Saunders, Philip Lewi and Adrian Thornhill (2019), precise identification of the study population assists in ensuring the applicability and generalizability of research results within the research context.

3.3 Sample Size.

Sample size calculation involved applying Yamane's (1967) formula for finite population sampling design with 5 percent margin of error level of significance:

$n = N/[1+N(e)2]$

Where, N is Population Size, e Margin of Error (5 percent), n Sample Size

Based on accessibility/feasibility in the context of field research (logistical challenges in rural Elgon regions), an accessible population of around 120 was used (comprising farmer representatives, extension workers, and BCU employees). Substituting the values:

$n = 120/ (1 + 120(0.05)^2)$

$= 120 / (1 + 120(0.0025))$

$=120 / (1 + 0.75)$

$=92$

Table 3.1: Sample size distribution

Category of Respondents	Estimated Accessible Population	Proportion (%)	Sample Size
Farmer Representatives	40	33%	30
Extension Officers	12	10%	9
BCU Staff	40	33%	30
Community Farmers	2	24%	23
Total	**120**	**100%**	**92**

Such sampling makes sure that there is proportional representation with farmer representatives and BCU personnel, which are among the critical decision makers making up sizable proportions of the sample along with the extension officers and community farmers.

3.4 Sampling methodology.

Stratified random sampling was used as the sampling methodology in conducting the study. In this method, stratification of the population was made in accordance with various strata, including farmers, primary society leaders, extension officers, and BCU management. Random selection from each of these strata ensured that the sample was unbiased. Bryman (2016) explains that the stratified sampling method makes the sample more representative since all critical groups within the population are taken into consideration. This was an appropriate sampling method since with varying responsibilities and experiences in sustainability initiatives. Stratification of the population ensures that insights from all stakeholders are captured, hence contributing to the analysis of the influence of sustainability on the coffee value chain.

3.5 Sources of data

This research employed both primary and secondary data collection methods in order to get a holistic and triangulated understanding of the topic. According to Cohen, Manion, and Morrison (2018), use of multiple sources of data helps validate the research results through cross verification. Thus, use of both primary and secondary data improves the reliability of the research results while at the same time increasing understanding of the sustainable practices in BCU.

3.5.1 Primary data collection

The primary data was gathered using face-to-face interviews and questionnaires. This data included first-hand opinions and perceptions of the role of sustainable practices in BCU in enhancing the production, quality, market access, and income from coffee production. According to Sekaran and Bougie (2020), primary data include contemporary and contextual information which is crucial for any research dealing with current events.

3.5.2 Secondary data.

The sources of secondary data were archival documents of BCU, reports of collaboration, literature from the Uganda Coffee Development Authority (UCDA) and other literature on the issue of sustainability and value chains. The literature provided the background information regarding the historical and contextual information on coffee production pattern, sustainability, certification and markets among others. Secondary data according to Creswell & Creswell (2017) play an important role in research since they provide both background information and comparative analysis of the existing literature and primary data.

3.6 Data Collection Methods.

This research adopted a mixed methodology approach to enhance the diversity, depth, and validity of results obtained. Specifically, this research involved the use of the following three main data collection techniques:

3.6.1 Structured Questionnaires.

These were self-administered and face-to-face questionnaires that were administered to all 170 respondents in each of the four groups. This technique provided quantified results regarding awareness, application, and effects of sustainable practices in terms of economy, ecology, and society by means of using Likert scales, multiple-choice questions, and some open-ended questions. The use of questionnaires ensured efficiency, reliability, and generation of statistically analyzable results.

3.6.2 Semi-Structured Key Informant Interviews (KIIs)

The semi-structured interviews involving key informant respondents mostly BCU staff members [managers and technical officers and extension officers was another important data gathering technique employed (roughly 15-20 interviews). This technique enabled an in-

depth study of institutions, resource mobilization, certification procedures, monitoring, difficulties encountered, and institutional outcomes regarding sustainable development.

3.6.3 Focus Group Discussions (FGDs)

A set of focus group discussions (FGDs) was conducted separately with community farmers and farmer representatives (roughly 4-6 FGDs, 8-12 people in each discussion group). FGDs provided an opportunity for an interactive conversation aimed at obtaining a collective experience, difficulties faced, social relationships (including those related to gender and youths), community benefits and losses due to sustainable practices, as well as recommendations on improving the sustainable initiatives.

3.7 Research Instruments.

Three major tools were designed and piloted prior to data collection.

3.7.1 Structured Questionnaire Forms.

Slightly modified to suit the characteristics of each target group, including demographic information, Likert-scale statements related to knowledge, attitudes, and effects, and brief open-ended questions.

3.7.2 Semi-Structured Interview Guide (for Key Informant Interviews)

The major themes covered were sustainability approaches and implementation, training and extension support, certification and marketing, cost and benefit assessment, challenges and facilitators, and recommendations for future actions.

3.7.3 Focus Group Discussion Guide.

Designed to facilitate discussion on important issues concerning farming practices, sustainability measures, their impacts, costs, contributions of women and youth, and community changes.

3.9 Data Processing and Analysis

3.9.1 Quantitative Analysis.

The quantitative data collected from the surveys were validated, coded (Likert scale of

1=Strongly Disagree to 5=Strongly Agree), analyzed using SPSS Version 28, and cleaned (including addressing issues of missing data, outliers, and normality). The descriptive

analysis involved computing frequencies and percentages to determine the level of awareness, adoption, and perceptions of impact. For inferential analysis, the Pearson correlation was employed to find out any possible correlation that exists between sustainability practices and impacts (e.g., income, yields). T-test or one-way ANOVA were applied to compare the attitudes of different stakeholders. Multiple regression analysis tested the effects of sustainability practices on the outcomes of the value chain.

3.9.2 Qualitative Analysis.

Qualitative information collected from the interviews and focus group discussions was transcribed, de-identified, and subjected to thematic analysis (Braun & Clarke, 2006). It entailed reading through the transcript's multiple times, coding meaningful concepts, clustering codes into themes (such as barriers, advantages, and gender roles), analyzing, and providing a description of the themes with supporting quotations. There was also double-coding of portions of the data by two researchers to improve consistency. Thematic analysis was mostly driven by the data but emphasized economics, ecology, and social dimensions of sustainability.

3.9.3 Integrated Analysis

In this case, a concurrent triangulation strategy (Creswell & Plano Clark, 2018) was used as part of the mixed methodology. Data from each group was analyzed separately at first, and then combined only during the interpretation process. Common tables presented both quantitative results in terms of means, correlations, etc., and qualitative results in the form of thematic statements and/or quotes which either reinforced, elaborated on, or justified the previous. This resulted in improved comprehension of the connection between sustainable operations and coffee value chains as well as more valid conclusions about BCU.

3.10 Ethical Considerations.

The research was conducted with utmost ethical considerations. Participants were briefed about the objectives of the study, and their voluntary consent was to be obtained before conducting the study. They were made to understand that participation in the study was purely voluntary, and they could withdraw from the study at any time without suffering any repercussions whatsoever. Their privacy would be guaranteed by making sure that no personal information would be divulged, and anonymous codes would be used in place of real names. The research would follow ethical considerations as outlined by the American

Psychological Association (APA, 2017). Such considerations include treating participants with dignity, ensuring their welfare, and managing their data ethically. In addition, the researcher will seek consent from relevant authorities within Bugisu Cooperative Union for the purpose of abiding by ethical considerations while conducting the research.

CHAPTER FOUR
DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.0 Introduction.

In this chapter, the data collected from coffee growers as well as other stakeholders involved in the coffee value chain under the Bugisu Cooperative Union (BCU) is analyzed. These data were collected through structured questionnaires distributed to the respondents as detailed in Chapter Three. The analysis in this chapter concentrates on the following themes; respondents' demographics, sustainability adoption, coffee economic viability, ecology conservation impacts, and social benefits and good governance issues. Frequencies, percentages, and means have been used to present the results.

4.1 Response Rate.

The total number of questionnaires that were distributed was 92, and out of this total number, 72 were filled and returned. The total number represents a response rate of 78.3%. It should be noted that in survey research, a good response rate is considered one that exceeds 60%. In accordance with such standards, a response rate of 78.3% in the current study can be considered sufficient.

4.2 Demographic Characteristics of Respondents

Demographic variables of the respondents give a broad idea about the background of the people who participated in this research. These variables were gender, age groups, educational qualification, number of years of experience in coffee farming, membership in PGCS, and
certification**.**

Table 4.1: Demographic and farm characteristics of respondents.

Variable	**Category**	**Frequency (N)**	**Percentage (%)**
Gender	Male	48	66.7
	Female	24	33.3
	Prefer not to say	0	0
Age Group	18–30	12	16.7
	31–45	32	44.4
	46–60	22	30.6
	Above 60	6	8.3
	Total	**72**	**100.0**
Highest Level of Education	No formal education	8	11.1

	Primary	20	27.8
	Secondary	28	38.9
	Vocational/Technical	10	13.9
	University/Other	6	8.3
	Total	**72**	**100.0**
Years Growing Coffee	Maximum	35	
	Minimum	2	
	Mean (Average yrs)	14.6	
Member of Primary Growers' Cooperative Society (PGCS)	Yes	61	84.7
	No	11	15.3
	Total	**72**	**100.0**
Certification Status	Fairtrade	18	25.0
	Rainforest Alliance	21	29.2
	Organic	7	9.7
	UTZ	6	8.3
	4C	4	5.6
	None	13	18.1
	Other	3	4.1
	Total	**72**	**100.0**
Year of Certification	Average year	2019	

Source: Primary Data, 2025

As shown in Table 4.1, it was observed that the vast majority of the participants were males (66.7%) while the rest of them were females (33.3%). This implies that there is a domination by males in the coffee growing business. However, it should be noted that women also take an active part in coffee production activities.

In regard to the demographic aspect, it was established that the majority of respondents belonged to the age range of 31-45 years (44.4%) and 46-60 years (30.6%). In such a way, one can claim that most coffee farmers belong to the age category which corresponds to their working age and therefore is favorable for implementing improved agricultural techniques. As for the respondents' education level, the most educated participants were those having completed secondary education (38.9%) followed by the completion of primary education (27.8%). Other participants had vocational training (13.9%) or higher education (university) (8.3%).

Furthermore, it is evident from the results that 84.7% of the respondents belonged to the Primary Growers' Cooperative Societies, whereas the remaining 15.3% were not members of such societies. The role played by cooperatives in enabling farmers to receive training and certification as well as access to markets is significant.

The mean number of years respondents have spent growing coffee is 14.6 years, with the lowest being 2 years and highest being 35 years. This implies that most respondents possess substantial experience in growing coffee.

As far as certification goes, the two forms of certifications which prevailed in the community were Rainforest Alliance Certification (29.2%) and Fairtrade Certification (25%). On the other hand, 18.1% of the respondents did not have any form of certification.

4.3 Adoption of Sustainability Practices

This section assessed the extend of adoption of sustainability practices among coffee farmers and where they get the knowledge about such practices.

Table 4.2: Descriptive statistics on adoption of sustainability practices

Variable	**Category**	**Frequency (n)**	**Percentage (%)**
Sustainability Practices Applied	Shade-grown / Agroforestry	32	44.4
	Soil conservation	37	51.4
	Organic manure / Composting	24	33.3
	Integrated pest management	24	33.3
	Water harvesting	20	27.8
	Climate-resilient seedlings	26	36.1
	Record keeping	22	30.6
	None	3	4.2
	Other	4	5.6
Level of Knowledge on Sustainability Practices	1. No knowledge	3	4.2
	2. Low	8	11.1
	3. Moderate	29	40.3
	4. Good	24	33.3
	5. Excellent	8	11.1
	Total	**72**	**100.0**

Source of Sustainability Information	BCU / Primary Society	30	41.7
	Extension officers	16	22.2
	Other farmers	10	13.9
	NGOs / Projects	9	12.5
	Radio / Phone messages	5	6.9
	None	2	2.8
	Total	**72**	**100.0**

Variable	**Category**	**Frequency (n)**	**Percentage (%)**
Change in Coffee Yield (5 –10 years)	Increased significantly	28	38.9
	Increased slightly	34	47.2
	Stayed the same	7	9.7
	Decreased slightly	2	2.8
	Decreased significantly	1	1.4
	Total	**72**	**100.0**
Average Coffee Price (UGX/kg)	Mean price	9,200	
	Minimum	7,800	
	Maximum	10,500	
Receiving Sustainability Premium	Yes regularly	29	40.3
	Yes sometimes	23	31.9
	No	12	16.7
	Total	**72**	**100.0**
Average Premium Received (UGX/kg)	Mean premium	750	
Economic Impact of Sustainability (Likert Mean Scores)	Household income improved	Mean = 4.15	
	Ability to cover farm costs	Mean = 4.05	
	Access to credit/inputs	Mean = 3.90	
	Overall profitability	Mean = 4.18	
	Stability of income	Mean = 3.92	
Costs Incurred Due to Sustainability Practices	Certification fees	18	25.0

	Extra labour	31	43.1
	Training time	20	27.8
	New inputs/seedlings	25	34.7
	Record keeping	17	7
	None significant	9	12.5
Benefits vs Costs Perception	Yes definitely	33	45.8
	Yes somewhat	22	30.6
	Neutral	11	15.3
	No, costs higher	4	5.6
	Not applicable	2	2.8
	Total	**72**	**100.0**

Source: Primary Data, 2025

From the findings, it is clear that among the various types of sustainability practices, soil conservation practices and agroforestry under the shade were the most prevalent, accounting for 51.4% and 44.4% of the respondents respectively. These two types of practices play a key role in the achievement of soil fertility and sustainability within coffee growing.

Other sustainability practices such as using seedlings resistant to climatic conditions (36.1%), using compost manure/organic manure (33.3%) and pest management (33.3%) were practiced by a relatively large number of respondents. However, only 27.8% of the respondents used water harvesting practices. As for sustainability practices knowledge, most of the respondents had an average level of knowledge, (40.3%) while good and excellent knowledge was reported by 33.3% and 11.1% of respondents respectively.

In relation to information regarding sustainability, 41.7% of respondents relied on BCU and Primary Societies, 22.2% on extension agents, and 13.9% on fellow farmers. This is indicative of the importance of cooperatives and extension work in disseminating knowledge on sustainability to farmers.

4.4 The effect of sustainability practices on the economic viability of smallholder coffee producers in BCU, Elgon region Uganda.

This objective examined the economic outcomes associated with the adoption of sustainability practices, including changes in coffee yields, prices, and perceived economic benefits.

Table 4.3: Descriptive statistics on the effect of sustainability practices on the economic viability of smallholder coffee producers in BCU, Elgon region Uganda.

Source: Primary Data, 2025

The study findings indicate that the majority of the farmers have seen an increase in their coffee yields within the past 5 to 10 years, with 47.2 percent reporting a slight increase and 38.9 percent reporting a considerable increase, while only a few percent reported a decrease in their yield.

On average, coffee prices earned by farmers were UGX 9,200 per kilogram, with coffee prices ranging from UGX 7,800 to UGX 10,500 per kilogram. Moreover, 40.3 percent of farmers earn sustainability premiums regularly, while 31.9 percent earn them occasionally.

The farmers also highlighted positive economic effects attributed to the adoption of sustainable practices. According to the results obtained from the survey conducted on this effect, the average value of profitability from sustainability practices was 4.18, which means that the respondents agreed that sustainability contributes significantly to profitability.

In addition to the above effects, sustainability practices also have their share of challenges. The most common costs incurred through the adoption of sustainable practices were extra labor (43.1%), extra inputs or seedlings (34.7%), and training (27.8%). Even though the above practices entail some costs, they offer more advantages than costs; 45.8% said the benefits definitely outweigh the costs, while 30.6% felt that the benefits outweigh the costs to some extent.

4.5 The contribution of sustainability practices on ecological stewardship in the BCU, Elgon region coffee value chain.

This objective examined the environmental impacts of sustainability practices adopted by coffee farmers.

Table 4.4: Descriptive statistics on the influence of sustainability practices on ecological stewardship in Elgon region, Uganda.

Indicator	SD (1)	D (2)	N (3)	A (4)	SA (5)	Mean	Interpretation
Reduced soil erosion / improved soil fertility	1 (1.4%)	1 (1.4%)	6 (8.3%)	28 (38.9%)	36 (50%)	4.32	Highly agree
More shade trees / biodiversity	1 (1.4%)	2 (2.8%)	7 (9.7%)	29 (40.3%)	33 (45.8%)	4.23	Highly agree
Reduced chemical fertilizer / pesticide use	2 (2.8%)	2 (2.8%)	9 (13%)	30 (41.7%)	29 (40.3%)	4.09	Highly agree
Improved water availability	1 (1.4%)	3 (4.2%)	8 (11%)	31 (43.1%)	29 (40.3%)	4.14	Highly agree
Reduced deforestation pressure	2 (2.8%)	3 (4%)	10 (14%)	30 (41.7%)	27 (37.5%)	4.05	Highly agree

Source: Primary Data, 2025

The results suggest a high level of consensus between the farmers that sustainability measures have been beneficial for environmental conservation. The statement "sustainability measures lead to a reduction in soil erosion and soil fertility" received the highest mean value of 4.32, suggesting that the participants strongly agreed with the statement.

Likewise, the participants agreed that sustainability measures have led to an increase in planting shade trees and biodiversity conservation (Mean = 4.23). Reduction in the use of chemical fertilizers and pesticides was mentioned by the participants, receiving a mean score of 4.09.

Other environmental variables include planting many shade trees in the past five years (40.3%) and some shade trees (38.9%). On average, farmers planted 34 shade trees.

4.6 The influence of sustainability practices on the social wellbeing and governance structures for smallholder coffee producers in BCU, Elgon region Uganda.

This objective assessed how sustainability practices influence social wellbeing, cooperative participation, and governance among coffee farmers.

Table 4.5.1 Descriptive statistics on the effect of sustainability practices on social wellbeing in BCU, Elgon region Uganda.

Social Indicator	**S D (1)**	**D (2)**	**N (3)**	**A (4)**	**SA (5)**	**Mean**	**Interpretation**
Participation in cooperative decisions	2 (2.8%)	3 (4.2%)	11 (15.3%)	27 (37.5%)	29 (40.3%)	4.05	Highly agree
Access to training and extension	1 (1.4%)	2 (2.8%)	8 (11.1%)	30 (41.7%)	31 (43.1%)	4.25	Highly agree
Trust with BCU / primary society	2 (2.8%)	3 (4.2%)	9 (12.5%)	29 (40.3%)	29 (40.3%)	4.11	Highly agree
Women / youth involvement	3 (4.2%)	4 (5.6%)	13 (18.1%)	28 (38.9%)	24 (33.3%)	3.89	Agree
Household food security	2 (2.8%)	3 (4.2%)	12 (16.7%)	30 (41.7%)	25 (34.7%)	4.02	Highly agree
Social status in community	2 (2.8%)	3 (4.2%)	10 (13.9%)	29 (40.3%)	28 (38.9%)	4.06	Highly agree

Table 4.5.2 Descriptive statistics of sustainability practices on governance and training Participation in BCU, Elgon region Uganda.

Variable	Category	Frequency (n)	Percentage (%)
Transparency of BCU / Primary Society	Very transparent	21	29.2
	Mostly	30	41.7
	Neutral	12	16.7
	Not really	7	9.7
	No	2	2.7
	Total	**72**	**100.0**
Training Attendance (last 2 years)	Yes, several	33	45.8
	Yes, once or twice	25	34.7
	No	14	19.5
	Total	**72**	**100.0**

source: Primary Data, 2025

From the results, it is clear that there was high consensus among the farmers concerning the contributions of the sustainability practices in terms of environmental conservation. The first statement that indicated lower soil erosion and higher soil fertility received the highest mean score of 4.32.

In addition, the second statement that stated that there were increased shades of trees planted by the farmers as a way of protecting biodiversity received a high mean score of 4.23. The third one concerning reduced use of chemical fertilizers and pesticides had a mean score of 4.09.

Other environmental measures reveal that 40.3% of the respondents planted a lot of shade trees during the last five years, while 38.9% planted some trees. They plant an average of 34 trees.

Cooperative decision-making also got high support from the participants with a mean score of 4.05. Nearly 77.8 percent of the participants strongly agreed that sustainability efforts have improved their participation in cooperative decision-making processes, showing empowerment of farmers and participative management within the coffee value chain.

Regarding household food security, the outcomes of this study indicate a mean score of 4.02 with nearly 76.4 percent of the participants who strongly agree that sustainability efforts have

contributed positively to food security at the household level. The findings reveal that farmers' improved management of their farms may lead to improved livelihoods.

Regarding farmers' social standing in the community, the outcome of this study reveals a mean score of 4.06. The majority of the participants, nearly 79.2 percent, strongly agreed that engagement in sustainability programs had improved their social standing in their respective communities.

However, women and youth participation received the lowest mean (Mean = 3.89). Although most of the participants (72.2%) agreed and strongly agreed that the participation of women and youth has improved over time, there were also 9.8% and 18.1% of respondents who disagreed and had neutral views respectively, meaning that while there have been positive changes, there is still a lot that needs to be done regarding inclusion of marginalized groups in cooperation and sustainability efforts.

There was a confirmation to these observations from the answers to the questions related to governance issues. It turns out that many cooperatives had good governance as indicated by the fact that 70.9% of respondents claimed that their cooperatives are mostly transparent or very transparent. Furthermore, 80.5% of all farmers said that they attended training sessions during the previous two years with 45.8% of participants attending several such meetings.

It can be concluded that the practice of sustainability in coffee industry benefits society and its well-being, but some more work should be done to improve gender equality.

4.7 General views and suggestions on Sustainability Practices

This section assessed farmers' general perceptions of sustainability practices and their importance for the future of coffee farming and also the suggestions of respondents on sustainability.

Table 4.6.1 Descriptive statistics of importance of sustainability for the future of coffee farming.

Variable	**Category**	**Frequency (n)**	**Percentage (%)**
Importance of Sustainability for Future Coffee Farming	Extremely important	34	47.2
	Very important	23	31.9
	Somehow	10	13.9
	Not very	4	5.6
	Not important	1	1.4
	Total	**72**	**100.0**

Table 4.6.2 Descriptive statistics of suggestions from respondents.

Theme Identified	**Number of Responses (n)**	**Percentage (%)**
Increase farmer training	21	29.2
Improve coffee prices / premiums	18	25.0
Provide farm inputs / seedlings	13	18.1
Improve market access	10	13.9
Strengthen cooperative governance	6	8.3
Other suggestions	4	5.6
Total	**72**	**100.0**

Source: Primary Data, 2025

It can be seen from the results that sustainable practices are viewed by the respondents as extremely crucial towards ensuring the sustainability of coffee farming in the future. Close to 47.2% of the farmers felt that sustainability was extremely important, whereas 31.9% felt that it was very important.

Suggestions by the farmers regarding improving the process of implementing sustainable practices have been elicited. Training farmers emerged as the most popular suggestion, at 29.2%, with improved prices of coffee and premiums being the second suggestion at 25%, followed by provision of farm inputs and seedlings (18.1%).

The results clearly show that farmers understand the importance of adopting sustainable practices in order to improve their economic, environmental and social performance.

Respondents were further asked to give suggestions on ways in which sustainable practices in the coffee value chain could be improved.

The most common recommendation among the group of 72 respondents was the enhancement of training for coffee farmers. This response was provided by 21 out of the total number of respondents, representing 29.2%.

The second most common recommendation among the respondents involved improvements in terms of price or premiums for the coffee beans. Specifically, 18 respondents, representing 25.0%, provided this type of response.

Providing farm inputs and seedlings was another common recommendation among the respondents. There were 13 farmers, making up 18.1% of the total, who gave this type of answer.

Market access is yet another recommendation commonly suggested by the respondents. It is worth noting that ten respondents provided this recommendation, making up 13.9% of the total number of respondents.

Another recommendation made by the respondents concerns good governance of the farmers' cooperatives. In this case, it should be noted that six respondents recommended this improvement.

There were other recommendations that were suggested by four respondents. These respondents represent 5.6% of the total number of respondents in the study.

In general, it can be said that the farmers recommend training, reasonable prices, and farm input accessibility, among other factors.

CHAPTER FIVE
SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSIONS

5.0 Introduction

In this chapter, we look at what has been found through the study of the impact of sustainability practices on the coffee value chain of the Elgon region, specifically the BCU located in Mbale, Uganda. Conclusions and recommendations will be provided in addition to suggestions for further research.

5.1 Summary and Discussion of Findings.

The key findings of the study are summarized as below

5.1.1 The effect of sustainability practices on the economic viability of smallholder coffee producers in Uganda. producers in Uganda.

The results of the research demonstrated a significant positive impact of sustainability practices on the economic sustainability of smallholder coffee producers belonging to Bugisu Cooperative Union. According to the results of the research, the use of sustainability practices like shade-grown agroforestry, soil conservation, organic composting, and integrated pest management was found to be high among coffee producers. Respondents indicated that sustainability practices contribute to income generation, coffee productivity, access to the premium market, and profitability level.

The results of the research suggested that a high percentage of respondents believe that the benefits related to the use of sustainability practices exceed the cost of implementing sustainability practices. The practices under discussion were found to contribute to higher productivity and lower risks due to fluctuations in prices for agricultural products due to their capacity to enable access to premium markets via certifications.

The above results corroborate the findings of previous research which has highlighted the importance of sustainability standards in increasing the economic viability of agricultural value chains. It has been shown in earlier works that certification and sustainability practices increase access to the international market for small-scale farmers by linking them with international buyers that prefer ethically grown coffee. Thus, the study confirms that sustainability practices greatly increase the economic viability of small-scale coffee farmers in Uganda.

5.1.2 The extent to which sustainability practices contribute to ecological stewardship in the Ugandan coffee value chain

The results of this study also show that sustainability practices have contributed immensely to ecological stewardship within the coffee value chain. The respondents were strongly in agreement that sustainability practices like agroforestry, soil conservation, minimal use of chemical fertilizers and pesticides, and water conservation have positively affected the environment in coffee-growing areas.

The indicators for soil conservation, soil fertility, shading, biodiversity, and water management were rated highly by the respondents. Therefore, it is safe to conclude that sustainability practices are vital in safeguarding natural resources and ensuring that coffee cultivation is environmentally sustainable.

According to existing literature, the application of sustainability practices, especially agroforestry practices, contributes positively to the improvement of soil quality and environmental degradation reduction. Within the Elgon region, the adoption of shade trees and soil conservation practices was essential in solving environmental issues such as soil erosion and landslides that are common in mountainous farming communities.

5.1.3 Influence of sustainability practices on the social wellbeing and governance structures of smallholder coffee producers in Uganda

Sustainability practices have been found to contribute to social wellbeing and good governance structures amongst the small-scale coffee farmers in Bugisu Cooperative Union. Some of the improvements noted by the respondents included enhanced opportunities for training and extension services, trust in cooperative institutions, and involvement in cooperative operations.

The effectiveness of training and extension service programs conducted via sustainability practices is very high, suggesting that farmers are receiving adequate training in improved farming practices, environmental protection, and cooperative management. The respondents indicated that the adoption of sustainability practices in the region has fostered strong ties between the farmers and the leadership of the cooperative.

Finally, it was observed that there were modest improvements in terms of gender and age inclusiveness in the process of coffee production and cooperative management. While it can

be concluded that much effort has gone into fostering inclusiveness, it can also be concluded that there is need for further improvement in terms of gender and age inclusiveness.

The results obtained are similar to the conclusions drawn by prior researchers that sustainability standards lead to better social outcomes due to greater empowerment of farmers, cooperative governance, and community relations.

5.2 Recommendations.

Bugisu Cooperative Union needs to develop strategies to continuously train farmers on the need for sustainable practices and how they can effectively implement them. Training will enable the farmers to practice more efficient farming systems that increase production and contribute to environmental conservation.

The cooperative union also needs to improve its transparency in handling premiums paid by certifying the coffee as sustainable so that farmers benefit more from such programs. Better communication on handling premiums will increase trust among farmers and cooperative leaders.

BCU management needs to encourage increased participation of women and youth in sustainability efforts and other activities within the cooperative union. This will be done through developing more training programs for these groups and giving them leadership opportunities.

The Ugandan government needs to come up with policies that will support farmers who practice sustainability and provide financial and technical aid. For example, there is need for provision of subsidies on certification fees and other inputs.

Policymakers will also need to enhance collaboration between cooperatives, development agencies, and international buyers of sustainable coffee.

5.3 Conclusions

The study findings indicate that sustainability practices can help to improve the performance of the coffee value chain in the Elgon region of Uganda. For instance, sustainability practices like agroforestry, soil conservation, and certification contribute towards enhancing the economic viability of smallholder farmers through increased production and profitability.

Sustainability practices also promote environmental sustainability through enhanced soil quality, minimized soil erosion, improved biodiversity, and improved resilience to climate change.

Moreover, sustainability contributes to improved social well-being and improved cooperative management through improved training of farmers, promotion of trust between the farmer groups and cooperative leaders, and involvement in cooperative activities.

Despite the above positive impacts of sustainability practices, there are challenges facing sustainability practices, which include certification cost, uneven distribution of benefits, and low involvement of women and youth in coffee value chain activities.

Overall, improvement of sustainability practices in Bugisu Cooperative Union will benefit the coffee industry in Uganda in the future.

References

ACDI/VOCA. (2018). *Bugisu Cooperative Union: A case study of institutional resilience in Uganda's coffee sector*. Washington, DC: ACDI/VOCA.

Berihun, T. (2024). *The economic impact of sustainability standards on smallholder coffee producers: Evidence from Sidama Region, Ethiopia* (Working Paper No. ETH-22247). International Growth Centre (IGC).

Bongers, A., et al. (2015). Coffee production and smallholder livelihoods in Uganda: Challenges of price volatility and climate change. *Journal of African Agricultural Research, 10*(4), 112-125.

Canwat, V. (2022). *The Uganda sustainable coffee toolkit: A guide for smallholder certification and climate resilience*. Kampala: Uganda Coffee Development Authority (UCDA).

European Commission. (2023). *Regulation (EU) 2023/1115 on the making available on the Union market and the export from the Union of certain commodities and products associated with deforestation and forest degradation*. Official Journal of the European Union.

FAO. (2025). *The state of food and agriculture 2025: Addressing land degradation and sustainability in global value chains*. Rome: Food and Agriculture Organization of the United Nations. https://doi.org/10.4060/cd7067en

ILO. (2024). *Cooperatives promote decent work in Uganda's coffee supply chain: Assessment of employment and labor conditions*. Geneva: International Labour Organization.

Jha, S., et al. (2014). Agricultural optimization: A review of the role of shade-grown coffee in biodiversity conservation. *Bioscience, 64*(9), 783–797.

Kessler, A., & Tokle, J. (2024). *Coffee sustainability reference code: Outcomes-focused framework for green coffee production*. Global Coffee Platform (GCP).

Ministry of Agriculture, Animal Industry and Fisheries (MAAIF). (2025). *Annual performance report on the Ugandan coffee sector: Export growth and sustainability targets*. Entebbe: Government of Uganda.

Murphy, S., & Dowding, T. (2023). *The global coffee value chain: Structural imbalances and the shift to sustainability*. London: Palgrave Macmillan.

Noponen, M. R., Edwards-Jones, G., Haggar, J. P., et al. (2012). Greenhouse gas emissions in coffee grown with differing input levels under conventional and organic management. *Agriculture, Ecosystems & Environment, 151*(1), 6-15.

Oxfam. (2024). *The compliance gap: How the EUDR threatens smallholder livelihoods in East Africa*. Oxford: Oxfam International.

Ponte, S. (2009). Governing through quality: Conventions and private standards in the coffee supply chain. *World Development, 37*(7), 1170-1182.

Rodríguez-Guevara, E. G., García-Bonilla, D. A., & Pineda-Ospina, D. L. (2024). Optimizing sustainability in the specialty coffee supply chain. *Entramado, 20*(2), 1-21. https://doi.org/10.18041/1900-3803/entramado.2.10840

Tukwatanise, B. (2023). *Deforestation and agricultural expansion in the Elgon Region: A 20year satellite analysis*. Kampala: Makerere University Press.

van der Werff, J. (2013). *The voluntary coffee standard index (VOCSI): Developing a composite index to assess the strength of sustainability standards*. (Doctoral dissertation). University of Twente.

Dear Respondent,

My name is Wanzala Alex and I'm a student at Uganda Christian University studying for a Bachelor of Business Administration. This study aims at exploring the influence of various sustainability practices like shade grown coffee, soil conservation and certification among others on coffee farmers and the entire value chain starting from production and marketing in the Bugisu Cooperative Union (BCU) in the Elgon area.

This particular questionnaire seeks your opinion on how these sustainability practices have influenced coffee farming. Your responses will play an important role in making this study productive and beneficial for the coffee growers and the Bugisu Cooperative Union.

Please be assured that taking part in this study is entirely optional and all responses provided by you will be kept confidential; no one will know who filled the form. You should be able to fill in the whole questionnaire in 10-15 minutes.

Thank you very much for your time and participation in this study. Sincerely,

Signature: .....

WANZALA ALEX, Researcher

Section A: Demographic and Farm Information (Just

tick in the box if you fall under provided options)

1. Gender:

☐ Male ☐ Female ☐ Prefer not to say

2. Age group:

☐ 18–30 ☐ 31–45 ☐ 46–60 ☐ Above 60

3. Highest level of education:

☐ No formal education ☐ Primary ☐ Secondary ☐ Vocational/Technical ☐ University/Other

4. How many years have you been growing coffee? _____ years

5. Are you a member of a Primary Growers' Cooperative Society (PGCS) under BCU?

☐ Yes ☐ No

6. Are you / your farm currently certified under any Voluntary Sustainability Standard (VSS)?

(Select all that apply) ☐ Fairtrade ☐ Rainforest Alliance ☐ Organic ☐ UTZ (now part of RA) ☐ 4C ☐ None ☐ Other (specify): _____

7. If certified, since which year? _____

Section B: Adoption of Sustainability Practices

(For all respondents i.e. farmers, leaders, etc.)

8. Which of the following sustainability practices are you / your group implementing on your coffee plantation? (Choose all that apply)

   ☐ Shade cultivation / Agroforestry (growing shade trees)

   ☐ Soil conservation (mulching, contour plowing, terracing)

   ☐ Organic fertilizers / Composting of coffee pulp

   ☐ Pest control management (minimal use of chemical pesticides)

   ☐ Water collection / conservation

   ☐ Planting resilient seeds / Reforestation

   ☐ Documentation for certification / Traceability

   ☐ None of the above

   ☐ Others (Please specify): _____

9. On a scale from 1 to 5, how knowledgeable are you / your group regarding sustainable practices / certification standards? (Please circle one).

   1 = No knowledge 2 = Poor 3 = Average 4 = Fair 5 = Excellent

10. From which sources do you / your group obtain knowledge / training on sustainable practices?

(Select top 2)

☐ BCU / Primary Society ☐ Extension officers (UCDA/NaCORI) ☐ Other farmers ☐ NGOs/projects ☐ Radio / phone messages ☐ None

11. Have you experienced any changes in your coffee production per acre in the past five to ten years?

☐ Substantially higher ☐ Higher ☐ Unchanged ☐ Lower ☐ Substantially lower

12. What is the approximate average price that you have been paid for every kg of parchment / kiboko coffee over the past two seasons?

UGX _____ / kg

13. Are you offered a premium due to your sustainability certification or practices?

☐ Yes, often ☐ Yes, sometimes ☐ No

Section C: Economic Viability

14. If yes, how much extra per kg on average? UGX _____

15. On a scale of 1–5, to what extent have sustainability practices / certification improved your:

1=Strongly disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly agree

(Please tick the appropriate box with your opinion)

Aspect	1	2	3	4	5
Household income from coffee					
Ability to cover farm costs					
Access to credit / inputs					
Overall profitability of coffee					
Stability of coffee income (less fluctuation).					

16. Which are the key costs that you have incurred by implementing sustainability practices /Certification? (Check all that apply)

☐ Audit/Certification costs ☐ Labor ☐ Training ☐ Purchase of inputs/seedlings ☐ Documentation ☐ None significant

17. Generally speaking, do you believe that the advantages of sustainability practices/certification outweigh the disadvantages?

☐ Definitely yes ☐ To some extent yes ☐ Neutral ☐ No, the cost is too high ☐ N/A

18. Open-ended: What are the economic difficulties you still experience despite your sustainability efforts? (for example: prices, costs, market access)

_____

Part D: Ecological stewardship

19. On a scale of 1-5, how much improvement have you noted on your farm/the region because of sustainable practices?

1=Strongly disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

Indicator	1	2	3	4	5
Reduced soil erosion / better soil fertility.					
More shade trees / better biodiversity.					
Less use of chemical fertilizers/pesticides.					
Better water availability / reduced runoff.					
Less deforestation pressure in the area.					

20. Have you planted shade trees or other trees on/in your coffee farm within the last 5 years?

☐ Yes, lots of them ☐ Yes, a few ☐ No, but planning to ☐ No

21. How many shade trees have been planted within the last 5 years?

22. Open question: What are some environmental advantages that you have noticed due to sustainable practices?

_____

23. Which environmental problems still persist in your community? (such as erosion, drought, pest infestation, etc.)

_____

Section E: Social Welfare and Good Governance

24. To what extent have sustainability practices / BCU certification activities contributed to:

1 = Not at all 2 = Slightly 3 = Moderately 4 = Quite a lot 5 = Very much

(Tick one box depending on your assessment of each item)

Aspect	**1**	**2**	**3**	**4**	**5**
Participation in cooperative decisions					
Access to training and extension services					
Relationship / trust with BCU and primary society					
Women's / youth involvement in coffee activities					
Household food security (e.g. intercropping, etc).					
Overall social status in community					

25. Is there transparency in the leadership structure and fair benefit distribution (premiums, inputs, etc.) within BCU / your primary society?

☐ Yes, extremely transparent ☐ Yes, fairly transparent ☐ Neither ☐ Not really ☐ No

26. Have you ever participated in any training / meeting regarding sustainability / certification within the last two years?

☐ Yes, frequently ☐ Yes, once or twice ☐ No

27. Open: Has sustainability / certification had any impact (positive or negative) on your family/community?

_____

F: General views and suggestions

28. In general, how crucial do you think sustainability is for the future of coffee cultivation in Elgon?

☐ Very important ☐ Quite important ☐ Somewhat important ☐ Slightly important ☐ Not important

29. What can BCU, UCDA or the government do to make sustainability more beneficial for you and other farmers?

_____

30. Anything else you would like to add?

_____

Many thanks for taking out your precious time and giving us your valuable opinions.

.....Good luck.....