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FACULTY OF COMMERCE

DEPARTMENT OF PURCHASING AND SUPPLY CHAIN MANAGEMENT

**THE EFFECTIVENESS OF GOVERNMENT POLICIES IN REDUCING
ENVIRONMENTAL IMPACT IN AGRICULTURAL SUPPLY CHAINS: A
CASE OF MASHONALAND CENTRAL IN ZIMBABWE**

BY

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE BCOM IN SUPPLY CHAIN MANAGEMENT DEGREE
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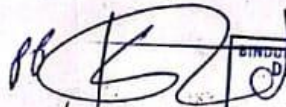
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DEDICATION

This dissertation is a special dedication to my family and friends who supported me through the trying times of my study.

ABSTRACT

The study investigated the effectiveness of government policies in mitigating the environmental impacts of agricultural supply chains in Mashonaland Central, Zimbabwe, where agricultural significance is challenged by post-harvest losses and environmental degradation, hindering the adoption of sustainable agroecological practices. The research aimed to evaluate policy implementation, identify challenges and gaps, assess stakeholder roles, and propose evidence-based recommendations for enhanced sustainability. Data was obtained through self-administered questionnaires and semi-structured interviews in Mashonaland Central. Quantitative data were analyzed using descriptive and inferential statistics (chi-squared tests) via SPSS (version 20.0), while qualitative data were analyzed thematically using NVivo. The findings revealed a significant lack of policy awareness among farmers and a divided perception of policy effectiveness, hampered by limited access to sustainable inputs, funding shortages, weak enforcement, and low stakeholder awareness. While NGOs and local communities were seen as important, overall stakeholder collaboration was moderately effective. The study concluded that current policies have limited effectiveness due to implementation deficits and a disconnect with grassroots realities. Recommendations include a more proactive role for NGOs and farmers' unions in localizing policy action, prioritizing awareness campaigns in local languages, advocating for farmer-centered innovations, facilitating access to eco-friendly inputs and incentives, building strong community platforms for collaboration, and conducting deeper research to inform policy reforms and stronger monitoring mechanisms.

Commented [WU1]: Limitations= lead recommendations to futures

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Chapter 1

Introduction and background of study

1.1 Introduction

The study investigates the effectiveness of government policies in mitigating the environmental impacts of agricultural supply chains in Mashonaland Central, Zimbabwe. Beginning with a global overview of policy interventions for sustainable land management, the introduction progressively narrows its focus to the specific challenges faced by Zimbabwe's agricultural sector and, more precisely, within Mashonaland Central Province. The subsequent sections articulated the problem statement, purpose, objectives, and significance of the study, ultimately providing a compelling rationale for this research as a critical contribution to fostering sustainable agricultural practices and enhancing environmental governance within the region.

1.2 Background to the Study

Globally, governments have sought to mitigate these impacts through policy interventions aimed at sustainable land management, afforestation, and conservation farming techniques. For example, the signing of the Cali Fund MoU, which supports biodiversity conservation, reflects an international commitment to addressing environmental concerns (Mrema, 2024). In a study by Barrios, Herren, Bicksler, Siliprandi, Brathwaite, and Moller, (2020) policy effectiveness depends on inter-governmental coordination and stakeholder engagement as argued and Dong, (2021) who highlighted that policy success is contingent upon seamless collaboration between different government agencies. However, ensuring that local community's benefit from these initiatives requires effective implementation at both national and provincial levels.

Agricultural supply chains are a vital component of Zimbabwe's economy, significantly contributing to food security, employment, and export revenues. Specifically, Zimbabwe has implemented several policies to mitigate the environmental impact of agricultural supply chains,

including sustainable land management programs, conservation agriculture initiatives, and subsidies for eco-friendly farming inputs. However, unsustainable farming practices, weak policy implementation, and inadequate agricultural extension support have resulted in environmental degradation, deforestation, biodiversity loss, and soil erosion. Addressing these challenges requires a robust policy framework that integrates environmental sustainability with agricultural productivity. According to FAO, (2023), agricultural extension services have played a crucial role in bridging the gap between policy objectives and on-the-ground adoption by facilitating knowledge transfer and farmer training. The Agricultural Extension Excellence Model (AEEM) offers a framework for improving extension services through structured interventions such as data collection, farmer profiling, and market linkages (Garwi, Masengu and Chiwaridzo, 2024). As such AEEM's emphasis on self-efficacy, confidence building, and programmed extension activities could enhance farmers' adoption of environmentally sustainable practices. Therefore, organizations such as Ministry of Agriculture and development partners are working to integrate biodiversity protection into agricultural policies, however local-level execution remains a significant challenge.

Mashonaland Central, a key agricultural hub, has seen various government interventions such as afforestation projects, conservation farming initiatives, and subsidies for sustainable agricultural practices. Specifically, the AGRITEX Department championed setting up conservation agriculture demonstration plots across the country (Manzungu, 2023). As agricultural extension was integral in implementing and adopting conservation agriculture in Zimbabwe (Chiduwa, Marenya, Ngoma, Ngowenani, and Chimonyo, 2023) this saw over 600 agricultural extension officers trained in 2009 through an FAO coordinated training programme (FAO, 2019). A conservation agriculture module was launched in 2010 to ensure students graduating with a Diploma in Agriculture from colleges are equipped with the correct information as they venture into their careers in agricultural extension (Bright Terrence and Ngavaite, 2021).

Despite these efforts, the effectiveness of extension interventions in Mashonaland Central has been inconsistent and remains uncertain due to challenges such as inadequate funding, low farmer awareness, resistance to change, and fragmented policy implementation; leading to low uptake of sustainable practices. Existing literature strongly suggests that inadequate capacities in farmers

and extension (Maphosa and Moyo, 2024), a need to train extension staff in conservation agriculture (Chiduwa, 2023) and machinery used to avoid problems encountered by farmers (Marenya, 2023) were highlighted as some of the challenges which hindered adoption. As seen in Mhondoro-Mubaira, a lack of resources and poor technology have hindered the effectiveness of extension services in supporting farmers with market-oriented and sustainable farming techniques. About 56% of communal farmers in Zimbabwe have reported receiving no agricultural marketing extension support, which limits their ability to transition to more sustainable methods (Mhlanga, Nyikahadzoi and Stack 2025).

Apart from the need to equip extension with relevant information, it remains unclear if extension officers were equipped with skills to meet the needs of different farmer social groups practicing conservation agriculture and newly resettled farmers whose needs centre on markets information, brokering between farmers, service providers, contractors and supply chain management skills (Matooane, Matamanda, Bhanye and Nel, 2025). Additionally, the Zimbabwean Ministry of Agriculture's political interests may not always align with climate-focused policies, thereby limiting their effectiveness (Mhlanga et al., 2025). The lack of integration between extension services, market access, and environmental policies has further exacerbated the issue. Moreover, poor extension delivery and lack of practical support have led to skepticism among farmers regarding government-led initiatives, further reducing policy effectiveness. Therefore, the study seeks to evaluate the effectiveness of these policies in fostering environmentally sustainable agricultural supply chains in Mashonaland Central. Accordingly, the research aims to provide insights into how Zimbabwe can enhance policy implementation to achieve a balance between agricultural productivity and environmental conservation through assessing the role of government policies, extension services, and market linkages.

1.2 Statement of the Problem

Mashonaland Central regional agricultural and food supply chain policies play a pivotal role in Zimbabwe's economy, providing food security for a substantial portion of the population. However, despite, the region being heavily reliant on agriculture it has exemplifies high post-harvest losses, limited infrastructure, and socio-political instability (Hove-Sibanda, Awino and Agyemang, 2025), leading to persistent environmental and socio-economic vulnerabilities

(Munuhwa and Hove-Sibanda, 2024). The effectiveness of government policies in mitigating the environmental impacts of agricultural supply chains continue to hinder efforts to integration of environmentally conscious agricultural supply chains through agroecological practices (Chiduwa et al., 2023) and digital technologies (Tinarwo and Erasmus, 2024), posing a critical policy implementation gap in the pursuit of sustainable agriculture. Existing literature suggests that while Zimbabwe has various agricultural policies and governance frameworks (Mutongoreni, Korera, Jachi, Chisiri, Machaka, Shumba and Mafunda, 2023), there is a questionable slow progress in integration of agroecological environmental conscious supply chain transitions, attributed to coordination and implementation gaps (Marenya, Ngoma, Matangi, Chimonyo and Chiduw, 2023), further complicates and limits the capacity of these agricultural policies to achieve their sustainable supply chain transformation. Therefore, the intricate relationship between the government, supply chain, and agroecological agricultural productivity underscores the need for comprehensive, well-coordinated sustainable agricultural policies (Assoua, Bomdzele, Omosehin, Osabuohien, Enwa, and Okunade, 2024).

1.3 Purpose of the Study

The purpose of the study is to explore the effectiveness of agricultural supply chains government policies and describe why policy implementation awareness, challenges, stakeholder roles, and proposing recommendations for sustainable practice explain the reduction in the environmental impact of agricultural supply chains in Mashonaland Central.

1.4 Research Objectives

This study sought to achieve the following objectives:

- To assess the level of environmental degradation in Mashonaland Central agricultural supply Chain.
- To assess the adherence of farmers to government policy in Mashonaland Central.
- To determine the impact of government policy in reducing land degradation in Mashonaland Central.

- To propose policy recommendations to enhance the sustainability of agricultural supply chains in Mashonaland Central.

1.5 Research Question

1. What is the current extent and specific types of environmental degradation present within the agricultural supply chain of Mashonaland Central?
2. To what extent do farmers in Mashonaland Central comply with existing government policies aimed at promoting sustainable agricultural practices and mitigating environmental degradation?
3. How effective have current government policies been in reducing land degradation specifically within the agricultural sector of Mashonaland Central?
4. What are the key challenges and opportunities for enhancing the sustainability of agricultural supply chains in Mashonaland Central, and what specific policy recommendations can be formulated to address these?

1.6 Significance of the Study

This study makes a significant contribution to the academic discourse on environmental governance and sustainability in agricultural supply chains. By focusing on the institutional linkages between research institutions and farming communities in Mashonaland Central Province, it adds to the growing body of literature exploring the intersection between government policy, environmental impact, and agricultural development. The research offers a nuanced understanding of how knowledge transfer mechanisms, such as agricultural extension services, can be optimized to improve environmental sustainability and food security in semi-arid regions. Furthermore, the findings help to bridge the gap between theoretical constructs and real-world applications, translating complex environmental and agricultural policy issues into practical insights that future scholars and researchers can build upon. This enriches existing theories related to agricultural systems, supply chain resilience, and rural development.

The study provides valuable insights for practitioners within the agricultural sector, particularly extension workers, farmer advisory bodies, agricultural training institutions, and international

research organizations. It demonstrates how robust agricultural extension frameworks can enhance farmers' access to critical information and technical assistance, ultimately improving productivity, resilience, and income generation in vulnerable rural communities. Organizations such as the Ministry of Agriculture, AGRITEX, CONEX, and international partners such as CIMMYT and CIAT can apply these findings to refine their strategies for training, information dissemination, and capacity-building initiatives. The study highlights the practical benefits of integrating sustainable farming practices and improved supply chain coordination, enabling practitioners to support farmers in adopting modern methods, responding to climate variability, and navigating evolving market and policy environments.

From a policy perspective, the findings of this research are critical in informing the design and implementation of more sustainable and inclusive agricultural policies in Zimbabwe. The study offers evidence-based recommendations that align with key government programmes, including the National Agriculture Policy Framework (NAFP), Agricultural and Food Systems Transformation Strategy (AFSTS), and the Zimbabwe Agriculture Investment Programme (ZAIP). It contributes to the development of environmentally compatible agricultural supply chains in semi-arid regions and supports policy efforts targeting food and nutrition security, rural employment, and agro-industrial growth. Moreover, the study provides a framework for aligning agricultural development with environmental protection strategies such as the Zimbabwe National Environmental Policy and Strategies (ZNEPS) and the Zimbabwe Wetlands Policy. As a result, it serves as a vital resource for policymakers aiming to balance productivity, sustainability, and resilience within Zimbabwe's agricultural sector.

1.7 Assumptions

Seven assumptions related to theoretical and practical implications were highlighted as follows:

- It is assumed that the way in which policies are implemented significantly affects their ability to achieve their intended environmental outcomes. Therefore, the study focused on the practical aspects of policy delivery through investigating coordination, resource

allocation, communication, and monitoring mechanisms to understand how they facilitate or hinder policy success.

- The study assumes that there is a discernible gap between the stated objectives of agricultural and environmental policies and their actual implementation and impact on the ground in Mashonaland Central. Therefore, empirical investigation was justified to assess the real-world impact of policies and pinpoint areas where implementation falls short of expectations. Theories of policy failure and implementation deficits were explored.
- It is assumed that identifiable challenges and gaps exist within the policy implementation process that hinder the adoption of environmentally sustainable practices. Therefore, frameworks for analyzing implementation barriers were utilized through categorizing and analyzing challenges as a crucial step towards developing targeted solutions.

1.8 Delimitations of the Study

This study is delimited to focus on the interplay of agricultural supply chain themes including environmental impact, sustainable and climate-smart agriculture principles, agroecology, carbon footprint, agricultural pollution, deforestation linked to agriculture, biodiversity considerations, agri-environmental management, and water conservation in farming practices. Furthermore, the study's scope encompasses government policies concerning environmental sustainability within the agricultural sector, addressing agricultural and environmental policy frameworks, government regulations, policy effectiveness, environmental governance, climate change policies, sustainable land management, agroforestry policy frameworks, natural resource management policies, and environmental conservation policies. Therefore, the primary units of assessment were agricultural extension workers and existing farmer groups to recognize the crucial role of extension services in disseminating knowledge and fostering sustainable practices at the grassroots level.

Geographically, the study was delimited to the Mashonaland Central Province of Zimbabwe due to its significant reliance on environmental impact in agricultural supply chains growth and its vulnerability related to poor infrastructure, limited access to credit, and inadequate extension services, which contribute to lower productivity and inefficiency including environmental issues such as land degradation, the impacts of climate change, and post-harvest losses. Therefore, the study aims to generate context-specific insights that can potentially inform strategies for bridging

the gap between agricultural potential and sustainable practices in other provinces within Zimbabwe and in similar developing nations facing comparable challenges.

In terms of time, the primary data collection for this study was conducted between April and May 2025. The analysis and findings were compared with recent empirical literature developments, trends, and policy implementations published between 2020 and 2025 within Zimbabwe and Mashonaland Central region. Additionally, the study drew upon theoretical concepts, particularly Policy Theories of Change, to ground the study findings in contemporary research and sustainable agricultural policy and practices contexts.

1.9 Limitations

Four limitations were considered in interpreting the findings and considering their broader applicability.

- The geographical focus on the selected province's identified challenges may not fully reflect the complexities present in other provinces and agricultural contexts, limiting the generalizability of the findings to other provinces within Zimbabwe or beyond different national settings. Therefore, the study employed a diverse sample of stakeholders' perceptions within Mashonaland Central Province to capture a range of perspectives relevant to agro-ecological zones, socio-economic conditions, and the specific nature and implementation of agricultural policies. Furthermore, the discussion of findings alignment with existing literature from other African agricultural systems was necessary for comprehensive generalization of further research relevance.
- Although stratified sampling ensured representation across key stakeholder groups, the reliance of purposive sampling to gather in-depth insights from agribusiness representatives based on their specific knowledge or role, introduced potential bias as it may not have captured the full spectrum of opinions within agribusiness representatives. Therefore, the study aimed for a diverse range of participants within each purposively sampled agribusiness representatives and ensured a high overall response rate which guaranteed greater confidence to the representativeness of the collected data within the study's scope.

- Although efforts were made to ensure anonymity and confidentiality to encourage honest responses, the reliance on questionnaire self-reported data introduced social desirability bias as respondents provided answers they perceived as more socially acceptable or aligned with the expectations of their respective organizations. Therefore, the study incorporated qualitative data collection methods which allowed for triangulation of findings and a deeper exploration of the underlying reasons behind the quantitative responses. As such, the convergence of themes across both quantitative and qualitative data strengthened the reliability of the overall findings.
- The findings did not capture the longitudinal trends and long-term impact of the policies under investigation due to the current situation of various evolving internal and external factors over time. Therefore, the study contextualized the findings within the existing literature and theoretical frameworks, providing a robust analysis of changes in government priorities, climatic events and economic shifts, agricultural systems and policy landscapes are dynamic, and perceptions and effectiveness. As such, future longitudinal studies were suggested to build upon these findings through tracking changes and assess the long-term effectiveness of interventions.

1.10 Definition of Terms

Agricultural Supply Chain – Processes involved in moving agricultural products from farms to consumers, including production, processing, storage, distribution and retailing (Arowosegbe, Alomaja and Tihamiyu, 2024)

Sustainable supply chains – Refers to the efficient resource use, reduction of carbon emissions and the production of ethical farming practices to ensure that agricultural activities can meet (Hove-Sibanda et al., 2025)

Agroecology - An approach to agriculture that integrates ecological principles to enhance sustainability (Barrios et al., 2020).

Sustainable Environmental Impact - The effect of agricultural activities on natural ecosystems, including deforestation, soil degradation, and water pollution (Nyagadza and Rukasha, 2023b).

Agricultural extension - Defined from a technology transfer, knowledge transfer and mode of agricultural extension transfer perspective where an out-of-school education process is employed for adults to learn by doing (Mugoni, Nyanhete, Tsikada, Pashapa and Munodawafah, 2023).

Policy Governance - Refers to the framework and strategies implemented by governments and organizations to advance sustainable agricultural practices including creating policies that align with global goals such as the Sustainable Development Goals (SDGs), promoting ecological farming methods, and supporting transitions away from industrial agriculture (Brahim and Figeczky, 2025)

1.11 Chapter Summary

The Chapter One firstly provided the background study on the effectiveness of government policies in mitigating environmental impacts within agricultural supply chains, while providing the background study to Mashonaland Central province case under study and then leading to the problem of the statement. This was done through illustrations from the global perspective scaling down to continents up to the country with the area of study. The chapter also described the purpose of the study, research questions, statement of the hypothesis, significance of the study, assumptions, delimitations of the study, limitations, definition of terms. The remainder of this research report is structured as follows:

- **Chapter Two: Literature Review:** Provided a comprehensive review of theoretical frameworks and related empirical studies concerning the effectiveness of different government policies instruments, while identifying knowledge gaps related to environmental impacts in agriculture, and supply chain dynamics.
- **Chapter Three: Research Methodology:** Detailed the specific methodological approach that was applied to answer the research questions, outlining the research design, data collection methods, the sampling techniques used, and the data analysis procedures.

- **Chapter Four: Presentation of Findings:** Presented data analysis results to highlight key findings and provided interpretation and discussions of findings in relation to the research questions, while comparing and contrast the findings with existing literature, and explore the implications of the findings for policy and practice.
- **Chapter Five: Conclusion and Recommendations:** Summarized the key findings of the study, reflecting the contributions to knowledge, and offered policy recommendations based on the research outcomes and future research.

Chapter 2

Literature review

2.1 Introduction

This chapter surveys the literature on government policies, environmental impact, and agricultural supply chains. It begins with the theoretical framework for understanding policy effectiveness in reducing environmental impact. The chapter then reviews empirical studies on government policies, their effects, and sustainability case studies in Zimbabwe's agriculture. This review emphasizes the relationship between economic, social, and environmental factors and the need for integrated, context-specific policies. The chapter concludes with a summary, setting the stage for subsequent research to address gaps and further explore sustainable agricultural supply chains.

2.2 Theoretical Review

This section delves into the theoretical foundations that reinforce the research, exploring the conceptual lenses through which Sustainable Food Supply Chain Management (SFSCM) practices are analyzed. It specifically examines Sustainability Theory, including its core tenets such as the triple bottom line, systems thinking, and stakeholder engagement, demonstrating the necessity to understand the complex interplay of environmental, social, and economic considerations within food supply chains.

2.2.3 Sustainability Theory

Sustainability theory is an interdisciplinary framework that evolved over decades, influenced by environmental science, economics and social sciences. A key milestone was the 1987 Brundtland Report, commissioned by the United Nations, which defined sustainable development as meeting present needs without compromising future generations (World Commission on Environment and Development 1987). In 1994, John Elkington introduced the triple bottom line (TBL) framework,

emphasizing environmental, social and economic performance, which became a cornerstone of corporate sustainability (Elkington 1994). The theory emerged in response to global awareness of environmental degradation, social inequality and economic instability, with environmental movements in the 1960s and 1970s and intensified dialogue in the 1980s and 1990s (Meadows et al. 1972). Sustainability theory thus advocates for a balanced approach integrating environmental, social and economic considerations for long-term sustainability.

This framework guides the exploration of SFSCM practices, their implementation, the challenges faced and the strategies to overcome these challenges to enhance food security.

In the context of SFSCM, environmental sustainability includes practices such as reducing carbon emissions, minimizing waste and using renewable energy (Yu et al. 2022b). Social sustainability involves ensuring fair treatment of workers, equitable distribution of resources, and fostering community well-being, as seen in practices such as fair pricing, supporting smallholder farmers and ensuring food safety (Lawrence et al. 2022b). Economic sustainability requires businesses to remain profitable while adopting environmentally and socially responsible practices, creating efficient supply chains that reduce costs and improve productivity (Adamu et al. 2023). Evaluating the economic benefits of SFSCM practices helps to assess their contribution to the overall sustainability of food industry organizations.

Systems thinking, another key concept within sustainability theory, views the food supply chain as an interconnected and interdependent system, crucial for understanding its complexity and dynamic nature. This perspective helps analyse the extent to which SFSCM practices are implemented and the interconnected challenges organizations face. For example, smallholder farmers in developing nations often encounter barriers such as limited access to markets and resources, leading to higher costs and food losses (Gatto and Chepeliev 2024b). Understanding these interdependencies is essential for developing effective solutions.

Stakeholder engagement is essential for achieving sustainability, involving all stakeholders, including suppliers, consumers, communities and governments, in decision-making to address their needs and concerns (Lu et al. 2022). This principle helps explore collaborative approaches to

overcoming the challenges in implementing SFSCM practices. Effective stakeholder engagement can lead to innovative solutions and shared benefits, as demonstrated by Barnana's collaboration with smallholder farmers through fair pricing and regenerative agriculture practices (Lu et al. 2022).

Critics argue that implementing sustainability practices can be challenging because of high initial costs, a lack of technical expertise and organizational resistance. Overcoming these challenges requires comprehensive support from policymakers, including subsidies for green technologies, training programmes to build expertise, and regulations encouraging sustainable practices (Lu et al. 2022).

2.3 Empirical Studies

The empirical literature review established the existing body of knowledge on the effectiveness of government policies, the challenges of implementation, the roles of various stakeholders, and potential policy recommendations for enhancing sustainability in agricultural supply chains.

Hove-Sibanda et al. (2025)

Hove-Sibanda et al. (2025) posited that sustainable food supply chains and agricultural logistics are fundamental for Africa's economic development and environmental stewardship. Their work establishes a broad context for the subsequent studies focusing on specific regional and policy contexts.

Mutongoreni et al. (2023)

Mutongoreni et al. (2023) specifically examined the Zimbabwean agricultural public policy and governance framework, revealing inconsistencies that hinder agribusiness development and marketing. While government interventions aimed to foster the sector, the intended outcomes remained elusive. The study recommended a multi-stakeholder, liberal approach with reduced government involvement, suggesting that treating agriculture as a self-financing business could lead to sustainable livelihoods and economic growth. This finding echoes earlier concerns about the effectiveness of top-down government control in agricultural development, as perhaps alluded to by Rambanepasi (1989:33) regarding policy implementation challenges in the broader African context.

Manzungu (2023)

Manzungu (2023) provided a socio-historical perspective on irrigation rights in Zimbabwe, highlighting the persistence of colonial-era regulations in the 2021 Irrigable Areas (Control) regulations. It was argued that these regulations, by treating irrigation as a privilege, may not provide a solid foundation for restoring irrigation rights to Black farmers and enhancing the rights of all irrigators. This raises critical questions about the equity and social justice dimensions of agricultural policies, which can indirectly impact environmental sustainability through resource access and management.

Marenja et al. (2023)

Marenja et al. (2023) conducted a six-part bibliographic survey on global lessons for closing the implementation and coordination gaps in agroecological policies in Zimbabwe. Their review identified critical gaps, particularly the need for overarching agroecological policy theories of change to coordinate individual policies and achieve inter-sectoral collaboration. Marenja et al.'s (2023) work highlights a significant challenge in translating policy intentions into tangible environmental outcomes, a point potentially foreshadowed by Greun (1993:96) in their broader analysis of policy coherence.

2.4 Chapter Summary

This chapter firstly focused on the theoretical framework of the study. Sustainability Theory was discussed as vital theories to inform the study. Secondly, the chapter mainly focused on giving relevant literature whilst attempting to answer the three main research questions which unpack the effectiveness of government policies in reducing environmental impact in agricultural supply chains. Key concepts such as government policies and environmental impact, agricultural supply chains, and sustainability and climate resilience were discussed with relevant literature support.

Chapter 3

Research methodology

3.1 Introduction

The research aims to analyze the environmental degradation within the agricultural supply chain of Mashonaland Central. The chapter outlines the research methodology employed in the study, detailing the research design, population and sample entailing the sampling procedures employed and their justification. The research instrument used is clearly described so as to bring out their strengths and weaknesses as way of justifying their selection and suitability to research. The chapter also highlights the steps in administering instruments and collection of data from participants' understudy.

3.2 Research Design

3.2.1 Descriptive Survey Design

The study employs a descriptive survey to gather data on identifying patterns and relationships between variables from the perspectives of supply chain managers from selected agricultural extension companies practicing governmental environmental sustainability practices. Creswell (2013), argued that a descriptive research design also known as statistical research, describes data and characteristics about the population or phenomenon being studied through aiming to answers the questions *who, what, when and sometimes how*. The basic research approach used was the Rapid Appraisal of Agricultural Knowledge Systems (RAAKS) methodology, adapted from Engel and Salomon (1993) in Nyagadza and Rukasha, (2023a) which is characterized by the active participation of all actors in problem definition, situation analysis and the identification of constraints to, and opportunities for, improvement.

3.2.2 Exploratory Research Design

Complementary research methodologies include exploratory research design to establish a foundational understanding of key informant (stakeholder)'s perspectives on government policies in reducing environmental sustainability. Accordingly, emphasis is on SFSCM practices within the food industry, which have not been extensively studied. Hay et al., (2020) highlights that exploratory research design is appropriate as it delves into a topic that has not been extensively studied and lacks a substantial body of prior research.

3.2.3 Case Study Approach

The study is logically examined as a single case study of Mashonaland Central Province to describe or define the effectiveness of government policies, providing insights into strategies to reduce environmental impact in agricultural supply chains. Case study is appropriate as suggested by Creswell and Creswell, (2023) in gaining concrete, contextual, in-depth knowledge about a specific real-world subject. Therefore, through this methodology, the study critically analyzed systems' capacities, constraints, strengths and weaknesses; individual organizations' roles, perceptions, resource endowments and collaborating partners; and the profiles and extension needs of beneficiaries. Information from tobacco farmers was also used.

3.3 Population

The study population comprises of all tobacco farmers in Mashonaland Central including a range of tobacco government bodies, farmer associations, and private contracting companies managing and influencing the complex web of tobacco production and its associated environmental and social impacts in Mashonaland Central. As of March 21, 2025, the province recorded 47,622 registered growers for the 2024/25 tobacco season (Chikwati, 2025). On the other hand, the provincial tobacco gatekeeper institutions that play distinct however interconnected roles in shaping the sector's dynamics include 5 Government and Regulatory Bodies (2025; ECLT, 2025; Fuza, 2025; The Chronicle, 2025; Kutsaga, 2022), 5 Farmer Associations and Unions (ZTA, 2025;

Manomano, 2025; The Herald, 2025) and 6 Tobacco Contracting Companies and Merchants (The Southern African Herald; WT Process and Machinery, 2025). Thus, a total of 16 institutions.

3.4 Sample Size

Based on the provided population details, Table 3.1 below illustrate the Tobacco Growers in Zimbabwe distributed by Farmer Type and Contract Status (2024/2025 Season)

Table 3.1: Sample Size Distribution of Tobacco Farmers

Tobacco Farmer Type	Number of Registered Growers
Communal Farmers	72,889
A1 Farmers	44,414
A2 Farmers	8,251
Small Scale	6,892
Total Registered Growers	132,446
Contracted Growers	119,515

Source: Mazhindu, 2025 applied as of March 21, 2025

To determine a statistically representative sample size for the farmers, Yamane (1967) formula based on a 92% confidence level and $e = 0.05$ where the probability of committing type I error is less than 5 % and with (Yamane, 1967), was utilized using the formula expressed as:

$$n = \frac{N}{1 + Ne^2}$$

Where, n = required sample size

N = the size of population

e = the error of 5 percent points/ level of precision (Yamane, 1967)

For the population of total registered tobacco growers ($N=132,446$) and contracted tobacco growers ($N=119,515$), a sample size of 399 were each drawn using the Yamane (1967) formula with $e=0.05$ amounting to a total of 798 tobacco farmers.

Additionally, for the institutions, it is feasible and desirable to include the entire population to ensure all key perspectives are captured, since their numbers are very small. Table 3.2 below outlines the sample distribution across different segments of the population in Mashonaland Central.

Table 3.2: Sample Size Distribution for Tobacco Government Bodies, Farmer Associations and Private Contracting Companies

Type of Provincial Tobacco Gatekeeper Institutions	Institutions	Sample Size
Government and Regulatory Bodies	Tobacco Industry and Marketing Board (TIMB)	5
	Ministry of Lands, Agriculture, Fisheries, Water and Rural Development	
	Tobacco Research Board (TRB/Kutsaga)	
	Environmental Management Agency (EMA)	
	Forestry Commission of Zimbabwe	
Farmer Associations and Unions	Zimbabwe Tobacco Association (ZTA)	5
	Zimbabwe National Farmers Union (ZNFU)	
	Tobacco Farmers Union Trust (TFUT)	
	Zimbabwe Commercial Farmers Union (ZCFU)	
	Zimbabwe Integrated Commercial Farmers Union (ZICFU)	
Tobacco Contracting Companies and Merchants	Tian Ze	6
	Shasha Tobacco (Pvt) Ltd	
	Northern Tobacco (NT)	
	Zimbabwe Leaf Tobacco (ZLT)	
	Mashonaland Tobacco Company,	
	Atlas Agri	
Total		16

Source: Developed by Researcher

As shown in table 3.2 above, the total sample of tobacco government bodies, farmer associations and private contracting companies was 16.

3.5 Sampling Techniques

The study primarily utilized two sampling techniques of Random Cluster Sampling for the large population of tobacco farmers and a Census approach for provincial tobacco gatekeeper institutions as detailed below:

3.5.1 Random Cluster Sampling

Random cluster sampling method was utilized to select the geographically dispersed population of tobacco farmers in Mashonaland Central. This technique was chosen for its efficiency in covering a wide geographical area while maintaining the randomness necessary for generalizability (Creswell and Creswell, (2023). The primary sampling units (clusters) for the farmer population were administrative districts and clearly defined tobacco-growing zones within Mashonaland Central Province. These serve as natural, geographically bound groupings of tobacco farmers. Accordingly, a comprehensive and up-to-date list of all administrative districts/tobacco-growing zones within Mashonaland Central Province will be compiled; thus, forming the sampling frame for the first stage. Mashonaland Central Province, located in northern Zimbabwe, is administratively divided into eight districts including Bindura, Mbire, Guruve, Mount Darwin, Rushinga, Shamva, Mazowe and Muzarabani (Editamaps, 2025). Therefore, these administrative districts serve as fundamental geographical units within the province (Pindula, 2025).

From this compiled list, a predetermined number of clusters will be randomly selected. This selection will be conducted using a simple random sampling technique through drawing lots or utilizing a random number generator) to ensure that each cluster has an equal probability of being included in the sample. The number of clusters to be selected will be determined based on practical considerations such as logistical feasibility, available resources, and the need to adequately represent the diversity of tobacco farming practices across the province.

Table 3.3: Administrative Districts of Mashonaland Central Province and Key Characteristics

District Name	Population (2012 Census)	Key Characteristics of Tobacco Farming
Bindura	156,842	Bindura also contributes to the province's overall tobacco output. Vast numbers of farmers, actively serviced by tobacco companies; indicate coverage in areas such as Chiweshe and Matepatepa and Bindura (Onhardt Tobacco, n.d).
Mbire	N/A	Detailed information on tobacco farming in Mbire District is less available. Its proximity to Guruve and Muzarabani suggests that some level of tobacco cultivation is likely to occur within its boundaries.
Guruve	184,828	Evidence suggests tobacco cultivation, with specific reference to tobacco seed production, indicating established tobacco farming activities with a notable role played by women in this delicate process. (Pindula, n.d. Guruve District).
Mount Darwin	199,105	Active smallholder tobacco farming (Sibanda, 2018) achieving good yields (average 2052 kg/ha). Major tobacco firms also operate contract farming schemes indicating its importance in tobacco production (Mutenga and Chivhenge, 2024).
Rushinga	67,134	Tobacco farming has become a primary economic activity in due to its high returns, although it has also led to environmental concerns such as deforestation for curing (Magudu, 2024).
Shamva	98,046	There is growing significance of small-scale farmers diversifying into tobacco production (Chibisa, 2024).
Mazowe	194,927	A significant tobacco-producing area for smallholder farmers; contract farming is prevalent, leading to job creation and agricultural diversification, though benefits may be skewed towards wealthier farmers. (Sibanda, Kaseke and Zikhali, 2014).
Muzarabani	107,718 (Centenary)	Fall within Natural Region IIa, which is characterised as primarily a tobacco and Centenary within the district focuses on commercial tobacco, indicating a strong suitability and prevalence of tobacco farming (Pindula, n.d. Muzarabani District).

Therefore, for the purpose of cluster sampling, the administrative districts themselves served as effective, geographically bound groupings of tobacco farmers. Specifically, while precise sub-district zones are not formally delineated, the prevalence of tobacco farming within each of these administrative districts ensures that they represent natural clusters of the target population. Advanced mapping initiatives, such as those by FAO, are developing high-resolution crop type maps for Zimbabwe (FAO, 2024), which could, in the future, provide more granular spatial data on tobacco cultivation areas. However, for current sampling frames, the administrative districts are the most practical and comprehensive units.

For each of the randomly selected clusters from, individual farmers were selected. Specifically, within each selected cluster, a comprehensive and up-to-date list of all registered tobacco growers for the 2024/25 season were obtained from Tobacco Industry and Marketing Board - TIMB records. This list served as the sampling frame for the second stage of sampling within that specific cluster. Accordingly, the frame allowed for the identification of both Total Registered Growers and Contracted Growers within the chosen areas. From the cluster-specific sampling frames, individual farmers will be randomly selected until the calculated sample sizes are met. To implement this, a systematic random sampling technique was employed within each selected cluster. This involves calculating a sampling interval (k) by dividing the total number of farmers in the cluster by the required sample size for that cluster. A random starting point was then selected within the first interval, and every k th farmer thereafter will be chosen until the required number of participants for each category (total registered and contracted) is reached. This method ensures that each farmer within the selected clusters has a known and equal chance of being included in the sample. While aiming for two distinct samples of 399 each (totalling 798), the selection process within clusters will carefully account for the overlap and ensure both groups are adequately represented for their respective analyses.

Overall, the random cluster sampling technique ensured that, while not every farmer in Mashonaland Central is directly listed and sampled individually, the randomly chosen clusters and

subsequent random selection of farmers within those clusters uphold statistical rigor and enhance the generalizability of the findings to the broader farmer population.

3.5.2 Census

A census approach was adopted for provincial tobacco gatekeeper institutions as argued that the population is small and highly specialized, comprising a total of 16 institutions. A census ensures that all critical perspectives and comprehensive information are captured from these key players. Therefore, census eliminated sampling error for the provincial tobacco gatekeeper institutions providing a holistic and exhaustive understanding of the institutional landscape and their interconnected roles in the tobacco agricultural supply chain in Mashonaland Central. As such all institutions were included in the study to include the 5 Government and Regulatory Bodies: Tobacco Industry and Marketing Board (TIMB), Ministry of Lands, Agriculture, Fisheries, Water and Rural Development, Tobacco Research Board (TRB/Kutsaga), Environmental Management Agency (EMA), and Forestry Commission of Zimbabwe. 5 Farmer Associations and Unions: Zimbabwe Tobacco Association (ZTA), Zimbabwe National Farmers Union (ZNFU), Tobacco Farmers Union Trust (TFUT), Zimbabwe Commercial Farmers Union (ZCFU), and Zimbabwe Integrated Commercial Farmers Union (ZICFU) and 6 Tobacco Contracting Companies and Merchants: Tian Ze, Shasha Tobacco (Pvt) Ltd, Northern Tobacco (NT), Zimbabwe Leaf Tobacco (ZLT), Mashonaland Tobacco Company, and Atlas Agri.

3.5 Research Instruments

Two research instruments of the questionnaire and interviews were utilised as follows:

3.5.1 Questionnaire

A questionnaire (Appendix B) served as the primary data collection instrument to collect data from ALL agricultural supply chains stakeholders; as been favored by the academic community due to their flexibility, simplicity, and strong relevance (Stinerock, 2023). Previous studies were used to define the variables, and the questions on the questionnaire were adjusted to fit the current study. The questionnaire is divided into five sections. Specifically, Section A focused on demographics information related to administration extension representatives. Section B focused on effectiveness of existing government policies, Section C looked at challenges and gaps in implementing sustainable agricultural policies, Section D focused on stakeholder roles in environmental sustainability and Section E focuses on Policy improvement and recommendations. Closed-ended statements are coded numerically using Likert scale responses from 1 to 5; gender as 1 = Male, 2

= Female as argued by achieve a higher response rate, enabling vast amounts of information to be gathered during a short period. On the other hand, open-ended responses are categorized thematically for qualitative analysis. According to Creswell and Creswell (2023) open ended questions help individuals express themselves more fully, paving the way for a deeper understanding, allowing for a richer exchange of ideas.

3.5.2 Interviews

To gather rich, detailed insights, in-depth interviews will be conducted with selected senior representatives from each of the 16 identified institutions. As Peterson (2012) notes, an in-depth interview is a qualitative data collection method involving intensive one-on-one conversations between a researcher and a participant. This approach, highlighted by DiCicco-Bloom and Crabtree (2006) as ideal for deeply exploring participants' experiences and perspectives, is anticipated to yield the highest quantity and quality of data (Boyce and Neale, 2006). An interview guide was utilized to ensure all relevant topics are covered, while open-ended questions will be designed to elicit comprehensive responses from the key informants. The interview guide used for data collection can be found in Appendix [see Appendix C for the interview Guide].

3.6 Data Collection Procedures

Data collected procedure firstly involved administering the questionnaire to the selected sample of agricultural extension supply chain representative. In obtaining the data, the researcher self-administered and distributed the questionnaire through a drop and pick method from period covering 3 days. Initially procedures for obtaining approval and approval for conducting the study was facilitated through the Institutional Review Board (IRB) cover letter from the university supervisor and departmental authorities (see appendix A) which was sought via an email. This was followed by seeking for permission to be questioned through a written consent form explaining the research objectives, participant rights, and data security measures of anonymity and confidentiality (see appendix D). Upon completion of the data collection, responses are screened for completeness and accuracy.

3.7 Data Presentation and Analysis Procedure

Data analysis according to Patton, (2015) is systematic process of applying statistical or logical techniques to organizing, summarizing, and interpreting the data to answer the research questions. Collected data were scanned for completeness and consistency, then organized into thematic categories aligned with the research objectives. Demographics quantitative data from Questions 1-4 and closed-ended questions 6, 7, 9, 15, and 17 were summarized using frequency distributions and presented visually through pie charts and bar graphs to illustrate general trends. Likert scale responses from Question 11 were summarized using descriptive statistics (means and standard deviations) and presented in tables to summarize respondent characteristics and opinions while showing agreement levels based on Best's (1977) criteria. The chi-squared test results and mean scores for examining relationships between categorical variables and comparing stakeholder responses on Likert scale items in Question 14 and were visualized using multi-bar charts for comparative analysis. Findings from qualitative data were triangulated with quantitative results to enhance the credibility and depth of the analysis. Specifically, open-ended questions 8, 10, 12, 13, 18, 19 and 20 were presented using coded themes and narrative descriptions to identify recurring patterns, themes, perceptions, and suggestions insights. Statistical Package for Social Science (SPSS 20.0 version) was utilized for data analysis purposes. All tables and figures were clearly titled and referenced in the text, with key findings highlighted. The interpretation of results was linked to the research questions and relevant literature.

3.8 Ethical Consideration

Within the context of research, the ethical considerations represent a written set of moral and value-based principles which provides guidelines on the most correct conduct towards the research participants (Burns, (2014:234). Therefore, for the purpose of the study, the following ethical principles were decided upon at the outset of the study:

Signing Informed Consent: Before beginning data collecting, consent was sought through pre visit. Specifically, the researcher subjected the consent form (see Appendix D), including introduction letter (see Appendix A) to the selected tobacco government bodies, farmer associations and private contracting companies and asked participants to sign to on the agreement

of participating in the study the participants. The goal of the study was explaining to the study participants during the distribution of the senior managers' questionnaire (Dane and Carhart, 2023).

Disclosing the Voluntary Participation: The research was voluntary and none of the respondent were forced to take part in the research however the researcher took time to explain to the respondents the importance of this research to them and to the research and any participation was highly appreciated

Avoiding collection of Confidential Information: All data collected in the selected institution were treated only for education purpose and no information was reproduced without the consent of the organization and the researcher.

Respecting the Privacy of Participants: The respondents were assured that the information they shared was confidential and all respondents were not allowed to give their personal details and all information was coded

Respecting the Anonymity of research configurations: The exploration was no aggregate division, and the examination configuration was applied in the form of a codes connecting the green procurement's variables to the personality of resource curse behaviours in the gold mining industry and composed assent frame was gathered to shape the isolated agreement from the information that the resource curse provides. Flick, 2022 supports that an entirely unknown study configuration is one in which it is difficult to follow information or data back to the examination subject from whom it was acquired. Therefore, the information helped to establish credibility and rapport in motivating individuals to respond to the questionnaire honestly and truthfully.

3.9 Reliability and Validity

Reliability

Reliability in research refers to the consistency and stability of a measure, indicating whether the study results are repeatable over numerous trials without influencing the outcome (Creswell, 2014). To ensure the dependability of the questionnaire used in this study, the Cronbach's alpha

(α) coefficient was employed as a key measure of internal consistency. According to Burns (2014), a Cronbach's alpha coefficient of ≥ 0.7 is generally considered a satisfactory and acceptable confidence index, signifying optimum reliability. Conversely, values below 0.7 are considered unacceptably low and suspicious. To achieve and maintain this acceptable threshold of 0.7 or above, all negatively worded statements within the questionnaire were carefully rephrased into positively worded statements. This adjustment, in line with recommendations from Saunders et al. (2016), aimed to enhance clarity, reduce potential participant confusion, and ultimately improve the internal consistency and reliability of the questionnaire's measurements.

Content Validity

Content validity was rigorously improved during the questionnaire design phase. This began by meticulously aligning the questionnaire items directly with the study's objectives. A thorough literature review was conducted to identify and categorize concepts and variables consistently used in other relevant studies. This systematic approach ensured that the questionnaire comprehensively covered the intended domain of inquiry. After its initial design, the questionnaire underwent testing to confirm its reliability and applicability, further strengthening its content validity.

Face Validity

To further enhance both content and face validity of the data collection instruments, the study leveraged the expertise of the supervisor with extensive experience in purchasing and supply chain management. The supervisor reviewed the observed variables and summated scales to assess the extent to which they accurately and fully encompassed the domain of the concepts being measured. Feedback from the supervisor was instrumental in identifying and eliminating any imprecise questions or researcher biases, as recommended by Creswell (2014). Consequently, ambiguous items were removed, constructs and their measures were reviewed and modified in line with the theoretical framework and the questionnaire was finalized. Furthermore, the ease with which respondents understood the study questions was assessed, and any ambiguities were promptly rectified to optimize face validity.

3.10 Chapter Summary

The chapter outlined the research methodology employed to assess environmental degradation within Mashonaland Central's agricultural supply chains. It details a comprehensive research design that integrates descriptive survey, exploratory research, and a case study approach. The chapter precisely defines the study population, encompassing both tobacco farmers and key provincial gatekeeper institutions, and explains the chosen sampling technique including random cluster sampling for farmers and a census for institutions, to ensure robust representation. Furthermore, it describes the research instruments including questionnaires and in-depth interviews and the systematic data collection and analysis procedures. Finally, the chapter underscores the ethical considerations upheld throughout the study and outlines the rigorous measures taken to ensure the reliability and validity of the findings.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter presents, analyzes, and discusses the data collected through the questionnaire on sustainability in agricultural supply chains. The chapter unfolds by first presenting the socio-demographic profile of the respondents, followed by thematic analysis of the main research sub-questions. The findings are presented using tables, figures, and narrative descriptions, guided by both quantitative and qualitative approaches. The analysis focuses on identifying trends, patterns, and stakeholder perspectives that informed the discussion of policy effectiveness, challenges, stakeholder roles, and areas for improvement.

4.2 Analysis of Response Rate and Occupation Distribution

Table 4.1 below illustrate the calculated response rate of different stakeholder groups.

Table 4.1: Calculated Response Rates by Stakeholder Group

Stakeholder	Questionnaires Distributed	Questionnaires Received	Response Rate (%)
Farmers in Mashonaland Central Province	100	96	96.0%
Agricultural extension officers	10	9	90.0%
Provincial EMA representatives	5	5	100.0%
Agribusiness stakeholders (GMB, GMAZ, CZR, CIPS)	5	5	100.0%
Government Departments (Ministry of Agriculture and Ministry of Environment)	3	3	100.0%
NGO Representatives	5	5	100.0%

Overall Response Rate	128	123	96.1%
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Source: Primary Data, 2025

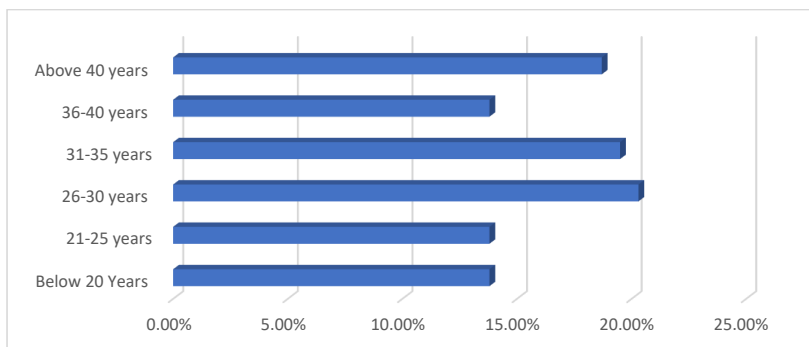
Table 4.1 illustrates the strong engagement of targeted participants, evidenced by an overall response rate of 96.1%. Notably, Farmers constituted the largest respondent group (78.0% of the sample) with a high response rate of 96.0%, underscoring their significant representation. While other key stakeholders, including Agricultural Extension Officers, EMA Representatives, Agribusiness Stakeholders, Government Departments, and NGOs, demonstrated complete response rates (100.0%), their smaller proportions (ranging from 2.4% to 7.3%) still provide valuable multi-faceted insights into the agricultural landscape.

4.3 Demographic Profile of Respondents

This section provides a background of the study participants. It includes age, gender, occupation, and level of education.

4.3.1 Age Distribution

Participants were asked to indicate their age group. Figure 1 below illustrate the age distribution provides insight into the demographic composition of respondents involved in the study.



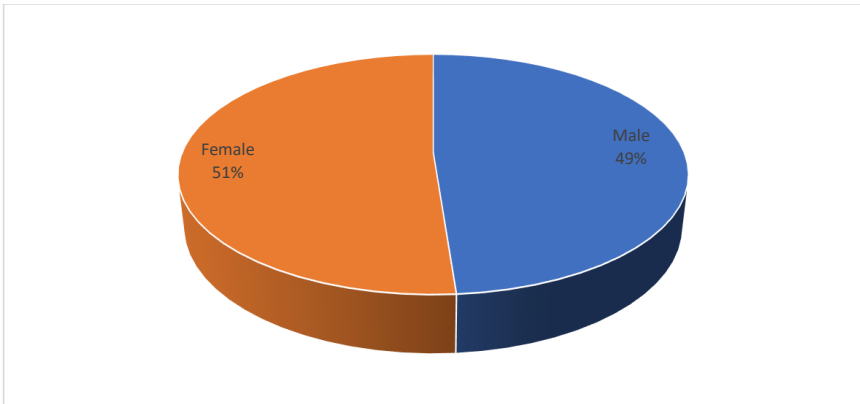
Source: Primary Data, 2025

Figure 1: Age Distribution of Respondents

Figure 1 above highlights a noteworthy observation is the strong representation of individuals aged between 26 and 35 years, who make up nearly 40% of the sample. This concentration suggests that the study captures perspectives from a group likely to be actively involved in agricultural activities and open to adopting sustainable practices. Additionally, the presence of respondents above 40 years, who make up a significant portion as well, indicates that experienced individuals still play a key role in shaping agricultural practices. Therefore, both youthful energy and seasoned experience contribute in understanding varying attitudes toward sustainability in agriculture.

4.3.2 Gender Distribution

Figure 2 below explores the gender distribution of participants in the study, providing critical insights into the gender dynamics within the agricultural sector in Mashonaland Central Province.



Source: Primary Data, 2025

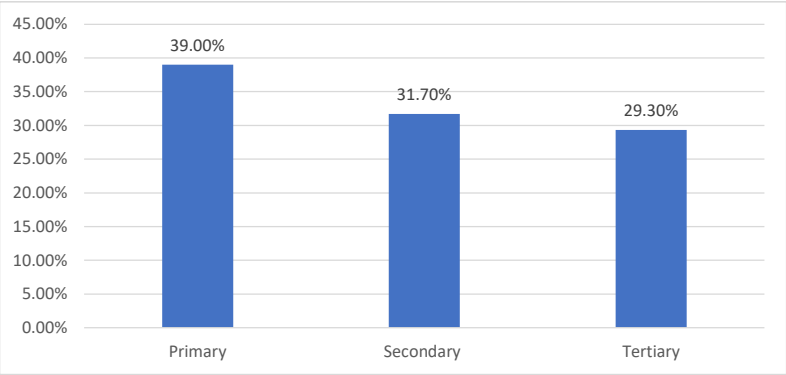
Figure 2: Pie Chart Showing Gender Distribution

Figure 2 above shows that the gender distribution of respondents is relatively balanced, with a slight majority of females (51.2%) compared to males (48.8%). This near-equal representation suggests that both men and women are actively engaged in the agricultural sector and were equally

accessible for the study. The slight female majority may reflect shifting gender dynamics in agriculture, where women are increasingly taking on more prominent roles.

4.3.3 Level of Education

Participants were asked to indicate their highest level of formal education. Figure 3 below presents the educational background of respondents as a key variable in understanding how individuals interpret, engage with, and apply environmental sustainability policies within Mashonaland Central Province’s agricultural supply chain.



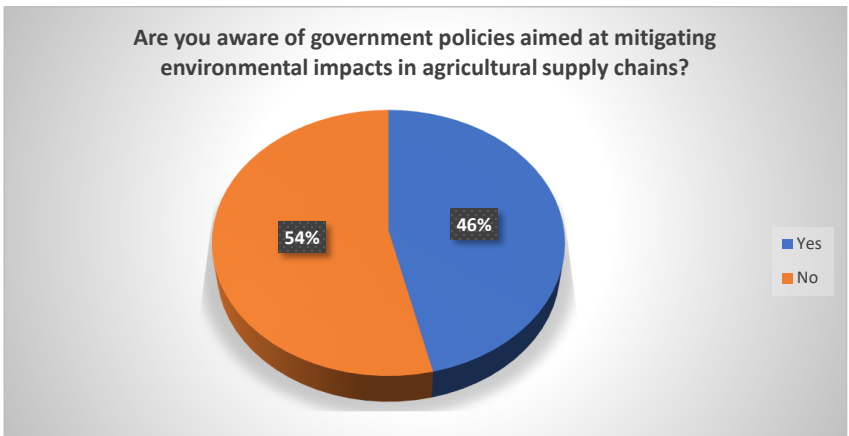
Source: Primary Data, 2025

Figure 3: Education Level of Respondents

Figure 3 above shows a broad representation across different educational backgrounds, with the largest proportion (39.0%) having attained only primary education. This suggests that a significant number of individuals involved in agriculture may have limited formal schooling, which could affect their access to or understanding of technical information related to sustainable practices. However, 39 respondents (31.7%) had secondary education, while 36 respondents (29.3%) had reached tertiary level which reflects a segment of the population that is potentially more familiar with modern agricultural techniques, environmental policies, or innovations in the supply chain.

4.4 Reducing Environment Degradation and Perceived Effectiveness of Government Policies

The theme relates to exploring agricultural supply chain stakeholder perceptions regarding the effectiveness of government policies in addressing environmental sustainability within the agricultural sector. Figure 4 below illustrate their level of awareness on government policies in implementation gaps, successes, and challenges that characterize the policy landscape specifically related to question 9.

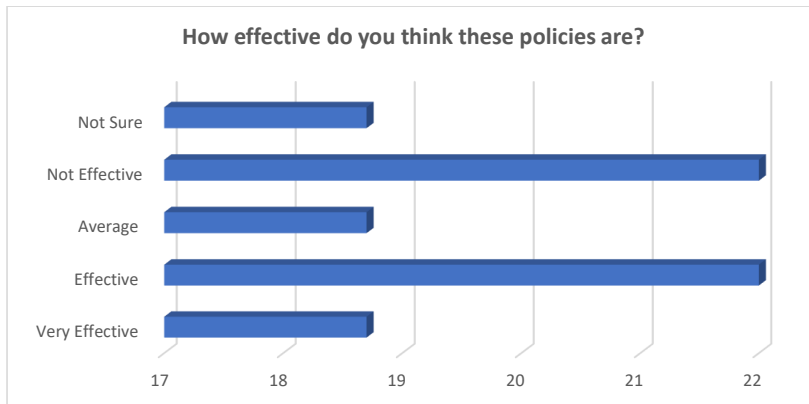


Source: Primary Data, 2025

Figure 4: Awareness of Government Policies

Figure 4 above revealed a notable gap in awareness of government policies aimed at mitigating environmental impacts within agricultural supply chains. More than half of the respondents, 66 individuals (53.7%); indicated that they are not aware of such policies, while only 57 respondents (46.3%) reported being aware.

Furthermore, respondents were asked to evaluate the effectiveness of policies on a scale ranging from *Very Effective* to *Not Effective*, Figure 5 below illustrate the bar chart to indicate whether these policies have improved sustainability outcomes in practice.

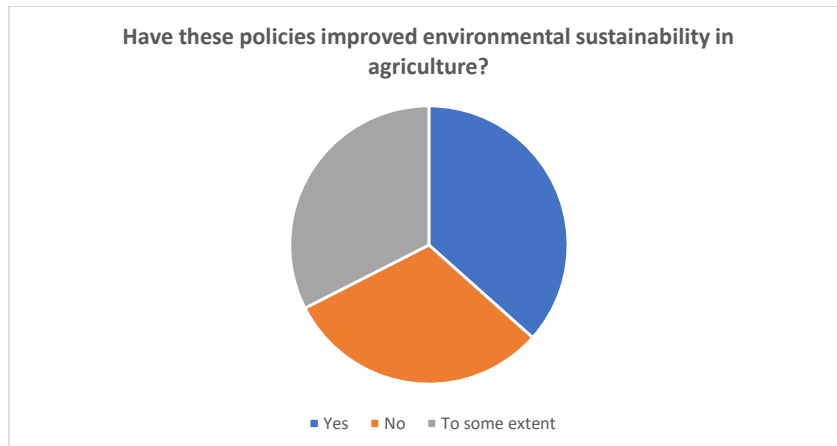


Source: Primary Data, 2025

Figure 5: Policy Effectiveness Ratings

Figure 5 above, shows that the data reveals a divided perception regarding the effectiveness of government policies aimed at mitigating environmental impacts in agricultural supply chains. While 27 respondents (22.0%) consider the policies effective and an equal number view them as not effective, a significant portion of the sample 23 respondents (18.7%) rate them as only average, and another 23 (18.7%) are unsure of their effectiveness. Interestingly, only 23 respondents (18.7%) believe the policies are very effective.

Participants were asked whether current government policies have improved environmental sustainability in agriculture. Figure 6 below gauges the real perceived impact of existing environment frameworks.



Source: Primary Data, 2025

Figure 6: Perceptions of Environmental Improvement

Figure 6 above highlights that the majority of respondents (63.4%) either felt that the policies have improved sustainability *to some extent* or *not at all*, which signals a significant level of uncertainty or dissatisfaction regarding the impact of government interventions. Only 36.6% of participants believed that the policies had made a clear positive impact.

The results in the table 4.2 below shows the Chi-Square Test of Independence used to statistically analysis the relationship between stakeholder occupation and their perception of policy effectiveness or collaboration.

Table 4.2: Awareness of Government Policy * Education Chi-Squared Test

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	.101 ^a	2	.951
Likelihood Ratio	.101	2	.951
N of Valid Cases	123		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 16.68.

Source: Primary Data, 2025

As shown in Table 4.2 above the Pearson Chi-Square value of 0.101 and a p-value of 0.951 indicate no statistically significant relationship between the variables tested. Since the p-value (0.951) is greater than 0.05, any observed differences in responses between groups (stakeholder types) are likely due to chance rather than a meaningful association. The same result is confirmed by the Likelihood Ratio, which also yields a value of 0.101 with the same p-value of 0.951.

4.5 Agricultural Supply Chain Challenges in Environmental Sustainability Policy Implementation

The theme is related to exploring the major challenges affecting the implementation of environmental sustainability policies within the agricultural supply chain. Table 4.3 below presents an assessment of descriptive statistics on perceived barriers to sustainability in agricultural supply chains, based on responses rated on a Likert statement in question 11.

Table 4.3: Descriptive Statistics of Implementation Challenges

	N	Mean	Std. Deviation
Lack of Funding	123	3.11	1.193
Weak Policy Enforcement	123	3.10	1.289
Low Stakeholder Awareness	123	3.07	1.304
Limited Access to Sustainable Farming Inputs	123	3.24	1.109

Source: Primary Data, 2025

As shown in table 4.3 above, all four challenges have mean scores above 3.00, indicating a general agreement among respondents that these are significant issues. Limited access to sustainable farming inputs stands out with the highest mean score of 3.24 and the lowest standard deviation (1.109), suggesting it is widely perceived as a prominent barrier and that there is slightly more consensus around this view. Lack of funding (*mean* = 3.11, *SD* = 1.193) and weak policy enforcement (*mean* = 3.10, *SD* = 1.289) also rank high, indicating financial and regulatory constraints are major concerns. Low stakeholder awareness has the lowest mean (3.07) and the

highest variability ($SD = 1.304$), showing a broader range of opinions on how much this factor affects sustainability efforts.

Table 4.4 below illustrate The Chi-Squared Test of Independence used to determine the relationship between stakeholders' level of education and their perceptions of the implementation challenges faced in enforcing sustainable agricultural policies.

Table 4.4: Implementation Challenges * Level of Education Chi -squared Test

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	22.782 ^a	22	.414
Likelihood Ratio	24.469	22	.323
N of Valid Cases	123		

a. 26 cells (72.2%) have expected count less than 5. The minimum expected count is .29.

Source: Primary Data, 2025

As shown in table 4.4 above Pearson Chi-Square ($\chi^2 = 22.782$, $df = 22$, $p = 0.414$). The p-value = 0.414 is greater than 0.05, indicating no statistically significant association between the variables under study, suggesting that any differences in observed frequencies are likely due to chance. Similarly, the Likelihood Ratio ($\chi^2 = 24.469$, $df = 22$, $p = 0.323$):test supports the Pearson Chi-Square result, confirming the lack of a significant relationship.

4.6 Assessment of Different Roles of Stakeholders Roles in Promoting Sustainable Agricultural Practices

The theme was related to the perceived roles and responsibilities of key stakeholders in advancing environmental sustainability within the agricultural supply chains in Mashonaland Central

Province. Table 4.5 below draws on question 14 responses to shows the descriptive statistics of mean and standard deviation on the perceived roles of different stakeholders grouped by category.

Table 4.5: Descriptive Statistics for Stakeholder Roles

	N	Mean	Std. Deviation
FARMERS ROLES	123	15.41	2.740
GOVERNMENT DEPARTMENT ROLES	123	15.93	2.589
NGOs ROLES	123	16.07	2.679
PRIVATE SECTOR ROLES	123	15.77	2.706
RESEARCHER ROLES	123	15.63	2.696
LOCAL COMMUNITIES ROLES	123	15.94	2.726

Source: Primary Data, 2025

Table 4.5 above shows that NGOs received the highest mean score (16.07), indicating they are perceived as playing a particularly strong role in advancing sustainability efforts. Local communities (mean = 15.94) and government departments (mean = 15.93), both scored relatively high, highlighting their perceived importance in supporting sustainable practices. Private sector (15.77), researchers (15.63), and farmers (15.41) follow closely, with mean scores that suggest they too are seen as important contributors, though with slightly less emphasis than NGOs and formal institutions. The relatively narrow range of mean values (from 15.41 to 16.07) and similar standard deviations (all around 2.6 to 2.7) suggest a broadly shared view among respondents that all these groups have meaningful, though varying, roles in achieving sustainability.

Building on the stakeholder roles analysis in promoting sustainable agriculture, Table 4.6 below shows the Chi-Square test statistical analysis to determine whether there is a statistically significant association between multiple stakeholder categories or responses to several items.

Table 4.6: Perceived Stakeholder Roles * Occupation Chi-Square Test

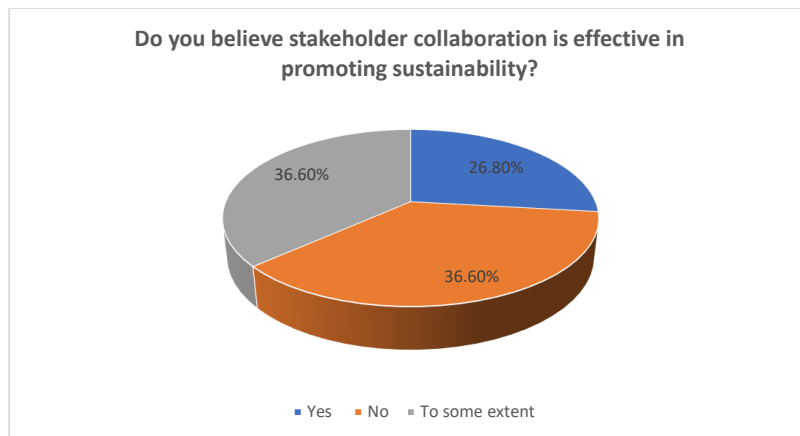
	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	105.355 ^a	135	.972
Likelihood Ratio	81.898	135	1.000
N of Valid Cases	123		

a. 160 cells (95.2%) have expected count less than 5. The minimum expected count is .02.

Source: Primary Data, 2025

As shown in table 4.6 above, Pearson Chi-Square = 105.355, df = 135, p = 0.972. The p-value of 0.972 is significantly higher than the conventional alpha level of 0.05, indicating that there is no statistically significant association between the variables analyzed; suggesting that any variations observed in the responses are due to random chance, and not a meaningful pattern. The Likelihood Ratio test, Likelihood Ratio = 81.898, df = 135, p = 1.000 used to confirm Pearson results, also shows no significant relationship. The p-value of 1.000 supports the same conclusion.

Figure 7 further incorporates findings from Question 15 to present respondents' perceptions on the effectiveness of stakeholder collaboration in promoting sustainability within agricultural supply chains.



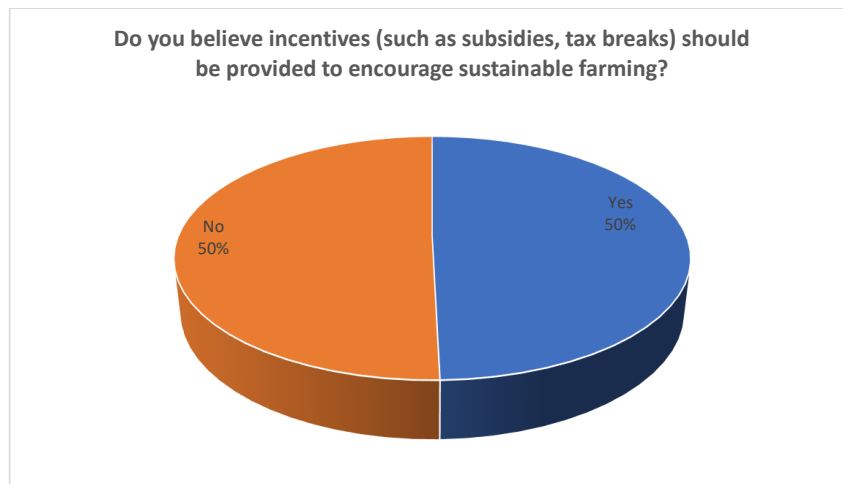
Source: Primary Data, 2025

Figure 7: Frequency and percentage analysis for Stakeholder Collaboration Effectiveness

Figure 7 above illustrate confidence in the effectiveness of such collaboration is relatively low. Only 26.8% of respondents believe it is effective, while a larger proportion (36.6%) do not believe it is effective at all. An equal percentage (36.6%) indicated that collaboration is effective only *to some extent*, suggesting that while the concept is recognized, its practical execution may be falling short.

4.7 Sustainable agricultural supply chain policy Recommendations Incentives in Mashonaland central Province

The theme related explores stakeholder perspectives on the need for incentives to encourage sustainable agricultural practices within the supply chain. Specifically, figure 8 below illustrate the pie chart showing stakeholders` responses in question 18 related to supporting the use of financial or non-financial policy tools.



Source: *Primary Data, 2025*

Figure 8: Should Incentives Be Provided?

Figure 8 above reveals a nearly even split in opinions regarding the provision of incentives such as subsidies or tax breaks to encourage sustainable farming. Slightly more than half of the respondents (50.4%) are *not* in favor of offering such incentives, while 49.6% support the idea. The narrow margin indicates a clear divide in perceptions, suggesting that while many recognize the potential role of financial incentives in promoting sustainability, others may question their effectiveness, fairness, or feasibility.

Table 4.7 below illustrate a Chi-Square test used to reflects a 2x2 categorical comparison, evaluating the relationship between gender vs. belief in stakeholder collaboration, or incentives vs. support for sustainability.

Table 4.7: Should Incentives be provided * Gender Chi-Squared Test Gender

	Value	df	Asymptotic Significance (2- sided)	Exact Sig. (2- sided)	Exact Sig. (1- sided)
Pearson Chi-Square	.201 ^a	1	.654		
Continuity Correction ^b	.072	1	.788		
Likelihood Ratio	.201	1	.654		
Fisher's Exact Test				.720	.394
N of Valid Cases	123				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 29.76.

b. Computed only for a 2x2 table

Source: Primary Data, 2025

As shown in table 4.7 above, Pearson Chi-Square ($\chi^2 = 0.201$, $p = 0.654$). The p -value > 0.05 indicates that there is no statistically significant association between the two categorical variables under comparison, suggesting no meaningful relationship. Continuity Correction (Yates' correction for 2x2 tables, $p = 0.788$) further confirms the Pearson Chi-Square result by correcting for small sample bias, especially in 2x2 tables. Fisher's Exact Test (2-sided $p = 0.720$) still supports the conclusion of no significant relationship.

4.8 Thematic Analysis Pertinent to Government Policies Effectiveness and Reducing in Mashonaland Central Agricultural Supply Chains Stakeholders' Environmental Impact

To complement the quantitative data, seven qualitative themes and quotes were utilized to assess the effectiveness of government policies in reducing environmental impact in Mashonaland Central agricultural supply chains as follows:

Theme 1: Perceived Awareness of Policies' Effectiveness

Two sub-themes emerged to highlight the dominant agricultural policies in Mashonaland central province; while also discussing the environmental issues associated with this deforestation, soil degradation, and water pollution practices.

Sub-Theme 1: Policies Known

In questions 8, one of the farmers shared the lack of clarity and practical guidance for implementation, particularly at the grassroots level highlighting that:

“We have heard about the Climate Smart Agriculture policy, but most of us don’t know how it’s supposed to be implemented at the farm level.”

One of the Agricultural Extension Officers added that:

“Yes, policies such as the National Climate Policy and the Agricultural Policy Framework are known to us, but many farmers lack awareness.”

The sub-theme highlights a disconnect between policy formulation and stakeholder understanding, which hinders effective policy uptake.

Sub-theme 2: Environmental Issues Needing Attention

In question 10, one of the farmers raised soil erosion as an environmental concern that are inadequately addressed by current agricultural policies as highlighted that:

“Soil erosion and deforestation are getting worse, but there’s little being done to support tree planting and land rehabilitation.”

On the other hand, one of the EMA representatives commented on water mismanagement that:

“Waste disposal from agrochemicals and plastic is not regulated well in rural farming zones.”

Therefore, the environmental concerns point to critical environmental gaps that require targeted interventions and policy revisions to ensure comprehensive coverage of emerging sustainability challenges.

Theme 2: Challenges in Policy Implementation

Two sub-themes focused on how the policy implementation challenges affect the overall effectiveness of the policies as follows:

Sub-Theme 3: Key Challenges in Policy Implementation

One of the farmers participants identified implementation bottlenecks affecting the policy's reach and effectiveness across rural and agribusiness settings as follows:

"The policies are there, but no one comes to explain them to us in a language we understand."

Additionally, one of the EMA representatives also elaborated that:

"Monitoring and enforcement are weak due to understaffing and lack of transport for field officers."

Therefore, in general stakeholders highlighted structural issues such as policy duplication, minimal private sector involvement, and politicization, all of which further hinder policy success.

Sub-theme 4: Suggestions to Address Challenges

To improve policy implementation, one of the farmers participants in question 13 proposed community-based training suggested that:

"Train us in local languages and bring demonstrations to our villages."

Similarly, one of the Agribusiness Stakeholder emphasized better coordination highlighting that:

"Establish formal dialogue platforms between government and private sector stakeholders."

Therefore, the recommendations highlighted the need for grassroots empowerment, better resource allocation, and structured collaboration to bridge the gap between policy and practice.

Theme 3: Stakeholder Collaboration

One sub-theme emerged on detail specific policies aimed at reducing environmental impacts.

Sub-theme 5: How to Improve Collaboration

In question 17 one of the Extension Officer proposed the improved collaboration between farmers, government, private sector, and NGOs as a key lever for sustainable agricultural development.

“Hold multi-stakeholder forums at ward level so we can coordinate efforts.”

Additionally, one of the NGO representatives emphasized trust-building as crucial elements as follows:

“Build trust with farmers first...then collaboration becomes natural.”

Therefore, stakeholder collaboration insights highlighted the value of participatory governance and inclusive platforms in driving collective sustainability action.

Theme 4: Policy Recommendations and Incentives

Two themes focused on suggested ways to enhance policy effectiveness, with a specific focus on agricultural supply chain incentives and suggestions for improvement as detailed below:

Sub-theme 6: Policy Recommendations and Agricultural Supply Chain Incentives

In question 18, one of the farmers provided recommendation on subsidies policy suggestions aimed at incentivizing sustainable agricultural practices as highlighted that:

“Give us subsidies for sustainable inputs like compost and drought-resistant seeds.”

On the other hand, one of the Government Officials noted reward schemes that:

“Include clear sustainability targets in agricultural financing schemes.”

Therefore, the policy incentives are crucial for motivating compliance and scaling up sustainable agricultural practices across the supply chain.

Sub-theme 7: Agricultural Supply Chain Institutional Suggestions for Improvement

In their concluding thoughts in question 20, one of the NGO representatives emphasized the importance of long-term support pointing out that:

“Include youth and women in sustainability planning—don’t leave them behind.”

Similarly, one of the Government Official stressed data-driven monitoring that:

“Monitor progress with real data, not just reports.”

Therefore, stakeholders conveyed a shared vision for sustainability—one that is inclusive, practical, and deeply rooted in community realities.

4.9 Discussion of Findings

Figure 4.4 shows that 53.7% of respondents were unaware of environmental sustainability policies, reflecting a critical gap in policy dissemination. This aligns with Mutongoreni et al. (2023), who highlight poor communication and inconsistent implementation of agricultural policies in Zimbabwe. Neo-institutional Theory (Skocpol, 1995; Hall and Taylor, 1996) helps explain this gap through the lens of institutional inertia and historical path dependencies that constrain effective policy uptake. Perceptions of policy effectiveness were split (Figure 4.5), with no significant difference across stakeholder occupations (Table 4.2), suggesting systemic issues in policy design and delivery. According to the Policy Windows Theory (Kingdon, 1995), this may result from vague implementation strategies and a lack of political prioritization. Figure 4.6 reinforces this concern, as 63.4% of respondents reported minimal or no impact of policies on sustainability outcomes. Coalition Theory (Sabatier and Jenkins-Smith, 1993, 1999) suggests that limited coordination among key stakeholders hinders the formation of effective advocacy coalitions necessary for policy reform. Qualitative responses identified key gaps in policy coverage, including issues such as soil erosion, agrochemical waste, and water mismanagement. These

findings echo Manzungu (2023), who critiques outdated irrigation frameworks in Zimbabwe. Sustainability Theory (Elkington, 1994) indicates that the failure to integrate social and economic aspects into environmental policy limits its practical effectiveness. Furthermore, the Agricultural Extension Excellence Model (Worth, 2006) highlights that poor knowledge transfer at the grassroots level undermines policy uptake and sustainable practices.

Descriptive statistics (Table 4.3) highlighted four primary barriers: limited access to sustainable inputs (mean = 3.24), lack of funding, weak enforcement, and low stakeholder awareness. These are consistent with the findings of Hove-Sibanda et al. (2025) and Williams et al. (2021), who cite infrastructure, coordination, and enforcement as persistent obstacles in African agricultural systems. The Chi-Square Test (Table 4.4) indicated no significant relationship between education level and perceptions of these challenges ($p > 0.05$), suggesting that systemic barriers are broadly felt, regardless of educational background. Farmers' qualitative feedback emphasized a lack of communication and language-accessible training, while EMA representatives pointed to understaffing and poor logistics. These insights align with Çakmakçı et al. (2023), who argue that limited enforcement capacity hampers policy success. Proposed solutions included community-based training, funding, and digital monitoring tools—aligning with Sustainability Theory and the AEEM model, both of which emphasize stakeholder empowerment and contextualized implementation strategies (Worth, 2006; Lu et al., 2022).

Table 4.5 shows NGOs, local communities, and government departments as the most active stakeholders. However, only 26.8% of respondents viewed collaboration as effective (Figure 4.7). This reflects an implementation gap, despite wide agreement on the importance of multi-stakeholder coordination (Mhlanga et al., 2025). The lack of a significant association between occupation and stakeholder role perceptions (Table 4.6) may reflect the absence of clear institutional frameworks to guide collaboration. From a theoretical perspective, the Advocacy Coalition Framework (Sabatier and Jenkins-Smith, 1999) and Sustainability Theory stress the importance of coordinated coalitions and systems thinking. However, institutional fragmentation

and weak policy alignment; described by Munuhwa and Hove-Sibanda (2024), remain barriers in Zimbabwe, unlike progress seen in countries such as Kenya and South Africa. Qualitative responses called for localized multi-stakeholder forums and improved communication platforms. These recommendations support the development of trust-based networks and integrated governance systems, prerequisites for coalition building and effective policy execution.

Figure 4.7 reveals a near-even split in stakeholder support for sustainability incentives, such as subsidies and tax breaks. While global literature advocates strongly for incentives (Yu et al., 2022b), the tepid local support may reflect mistrust in program administration or prior failures (Prosper Bright et al., 2021). No gender-based differences in opinion were found (Table 4.7), suggesting that broader systemic factors shape stakeholder attitudes more than individual demographics. Qualitative feedback emphasized context-specific recommendations, including subsidies for drought-resistant seeds and integrating sustainability goals into financing programs. These reflect key components of Policy Theories of Change, including Resource Mobilization and the Advocacy Coalition Framework. Calls for inclusive planning, youth engagement, and data-driven monitoring further underscore the need to enhance institutional resilience through transparency and empowerment (Jolly et al., 2023; Tinarwo and Erasmus, 2024).

4.10 Summary

The chapter revealed that while stakeholders in Mashonaland Central Province are aware of environmental policies in agricultural supply chains, they largely perceive these policies as ineffective due to insufficient funding, weak enforcement, limited technical support, and inconsistent policy. NGOs and government are seen as the most active stakeholders, however overall collaboration is only moderately effective, with NGOs reporting higher satisfaction with their roles compared to farmers and government officials. Key recommendations include improved communication, inclusive policy development, and regular forums to enhance collaboration. Particularly, over 85% of participants support incentives such as subsidies and tax breaks to encourage sustainable practices. The study highlights a significant gap between policy awareness

and effective implementation, providing crucial insights for improving environmental sustainability in the region's agricultural supply chains.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The study set out to investigate the effectiveness of government policies in reducing the environmental impact of agricultural supply chains in Mashonaland Central Province, Zimbabwe. This was motivated by growing concerns over environmental degradation, inefficient resource use, and unsustainable agricultural practices in the region, despite the existence of various policy frameworks. A mixed methodological approach was used, combining a descriptive survey, exploratory design, and a case study strategy to gather both quantitative and qualitative data from key agricultural stakeholders. Specifically, the quantitative analysis provided a comprehensive understanding of stakeholder perceptions, demographic composition, policy awareness, implementation challenges, and recommendations related to environmental sustainability in agricultural supply chains within Mashonaland Central Province. Qualitative analysis presented research-based themes on the Effectiveness of Government Policies in Reducing Environmental Impact in Agricultural Supply Chains in Mashonaland Central. Stratified and purposive sampling techniques were employed to select a sample of 127 participants, including farmers, agricultural extension officers, EMA officials, agribusiness representatives, government departments, and NGOs. Data were collected primarily through a questionnaire (the same questionnaire (Appendix B) was administered to all stakeholder) and analyzed using SPSS and NVivo.

The study faced limitations, including the restricted geographic focus on Mashonaland Central which may affect the generalizability of findings to other regions, and the use of non-probability sampling for some stakeholder groups, which may introduce bias. However, the study produced critical insights into stakeholder perceptions, policy implementation gaps, and areas needing improvement. The findings of this study reveal six main critical implications regarding the effectiveness of government policies in reducing environmental impacts within agricultural supply chains in Mashonaland Central Province. These are:

- Firstly, there is a clear disconnect between policy awareness and implementation, with over half of respondents unaware of existing environmental policies. This highlights the need for improved communication and policy dissemination at grassroots level.
- Secondly, perceptions of policy ineffectiveness are widespread and consistent across stakeholder groups, suggesting systemic issues rooted in weak enforcement, poor coordination, and political misalignment. Current institutional frameworks lack the capacity to translate policy into meaningful practice.
- Thirdly, overlooked environmental issues such as soil erosion, deforestation, and agrochemical waste indicate a narrow focus in existing policy frameworks. A more integrated and holistic approach to sustainability is urgently needed.
- Fourthly, the role of agricultural extension services in promoting environmental sustainability is underutilized. The lack of localized, accessible training limits the ability of farmers to adopt sustainable practices.
- Additionally, key barriers such as funding shortages, limited access to sustainable inputs, and weak stakeholder collaboration continue to undermine policy effectiveness. While NGOs and communities play notable roles, collaboration is often superficial due to the absence of structured, trust-based platforms.
- Finally, skepticism around incentives reflects a deeper mistrust in institutions, pointing to the need for transparent, inclusive, and accountable support mechanisms. Strengthening institutional resilience and integrating digital innovations can help close the policy-practice gap and foster long-term sustainability.

In spite of these constraints, findings and observations were made to reveal that the high overall response rate (96.1%), with strong participation from farmers and full engagement from institutional stakeholders such as EMA, NGOs, and government departments, confirms the reliability and representativeness of the dataset. Accordingly, this broad stakeholder involvement lends credibility to the study findings and ensures a multi-dimensional view of the agricultural sustainability landscape. In support, demographic analysis revealed a balanced gender distribution and a predominance of respondents aged between 26–35 years, indicating the involvement of both energetic youth and experienced individuals in agriculture. On the other hand, the varying educational backgrounds, ranging from primary to tertiary levels, further highlight the need for policy communication and training strategies that are accessible to all literacy levels. Therefore, the following conclusions were drawn as follows:

5.2 Conclusions

The conclusion of the research study on major causes of staff turnover in the hotel industry were are summed up to answer sub-problems stated in chapter one.

5.2.1 How effective are existing government policies in mitigating environmental impacts within agricultural supply chains in Mashonaland Central?

- The research data indicates limited awareness (46.3%) among stakeholders regarding existing government environmental policies in agriculture.
- Only a small proportion of respondents, 36.6%, believed that these policies have effectively improved environmental sustainability.
- Statistical analysis showed no significant association between awareness levels and education ($p = 0.951$), suggesting a lack of awareness across educational backgrounds.
- Smallholder farmers, in particular, expressed confusion about how to implement these policies in their daily farming activities.

- Both farmers and environmental officers reported that current agricultural policies do not adequately address environmental issues such as soil erosion, deforestation, water mismanagement, and agrochemical pollution.
- A key finding is that existing measures are perceived to lack enforcement and do not provide specific interventions to mitigate these environmental challenges.

5.2.3 What are the major challenges and gaps in implementing sustainable agricultural policies?

- The primary barriers to effective policy implementation identified in the research were limited access to sustainable inputs, lack of funding, weak policy enforcement, and low stakeholder awareness, all with mean Likert scores above 3.00.
- The relationship between education level and the perception of these challenges was not statistically significant ($p = 0.414$), indicating a shared experience of these barriers across educational attainment.
- Specific challenges highlighted include poor coordination among government departments, inadequate funding, limited training for farmers, and weak monitoring systems.
- Farmers reported a lack of communication in local languages regarding policy implementation.
- Environmental officers cited logistical constraints such as understaffing and limited transport as hindrances to outreach and monitoring efforts.

5.2.3 What roles do stakeholders play in ensuring environmentally sustainable agricultural supply chains?

- NGOs, local communities, and government departments were perceived as the most proactive stakeholder groups in driving sustainability.
- Despite this, only 26.8% of respondents viewed current stakeholder collaboration as effective, indicating a gap between perceived roles and actual coordination.
- Statistical analysis revealed no significant association between occupation and perceptions of stakeholder roles ($p = 0.972$).
- Participants suggested community-based training programs, the use of local languages, better resource allocation, and digital tools to support policy enforcement and compliance.
- The research highlighted weak stakeholder collaboration and emphasized the importance of multi-stakeholder forums, trust-building, and inclusive engagement to improve environmental sustainability in agriculture.

5.2.4 What policy measures can be introduced or improved to enhance sustainability in agricultural supply chains?

- Opinions on whether incentives should be provided to promote sustainability were nearly equally divided, with no statistically significant difference based on gender ($p = 0.654$).
- Stakeholders recommended subsidies for eco-friendly inputs, reward schemes for sustainable practices, and the integration of environmental targets in agricultural financing models as potential incentives.
- Participants emphasized the importance of inclusive and data-driven policy planning, advocating for the involvement of youth, women, and marginalized communities in sustainability programs.
- Government officials acknowledged the need to shift from report-based monitoring to real-time data tracking to ensure accountability and measurable progress.

5.3 Recommendations

In light of the above conclusions, it is recommended that NGOs, local councils, and farmers' unions take a more proactive role in translating national sustainability policies into practical, localized action. This can be done by organizing field-based workshops and participatory learning forums that explain policies such as the Climate Smart Agriculture Policy in ways that resonate with smallholder farmers' everyday experiences.

While government policies exist, a major gap lies in understanding and applying them on the ground. It is therefore recommended that NGOs and local councils prioritize awareness campaigns delivered in local languages and through familiar platforms such as churches, community meetings, radio broadcasts, and mobile alerts; to ensure broad and inclusive outreach.

This study recommends that farmers' unions serve as vital bridges between policymakers and the farming community. They should advocate for better policy alignment with local realities and push for farmer-centered innovations in sustainability practices. By doing so, they can ensure that the voices of their members shape agricultural decisions from the bottom up.

Given widespread concern over funding and input access, it is also recommended that NGOs and local authorities work collaboratively to facilitate access to eco-friendly inputs and promote incentive schemes. This includes lobbying for sustainable input subsidies, setting up reward systems for environmentally conscious farming, and helping farmers link with ethical markets.

This study further recommends that NGOs and unions invest in building strong community platforms where farmers, extension officers, and civil society actors can regularly meet, share feedback, and co-design solutions. These forums can foster trust, improve coordination, and enhance local ownership of sustainability programs.

Lastly, it is essential that policy advocacy organizations conduct deeper research on how sustainability policies are working in real farming contexts. They should use this evidence to campaign for reforms, increased funding, and stronger monitoring mechanisms—ensuring that sustainability is not just a buzzword but a lived reality for rural communities.

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APPENDICIES

APPENDIX A: COVER LETTER

Department of Purchasing and Supply Chain Management
Bindura University of Science Education
Bindura

7 April 2025

Dear Sir/Madam

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT YOUR INSTITUTION

I am a student in the department of Purchasing and Supply Chain Management at Bindura University of Science Education (BUSE) in Bindura. I am pursuing a degree in purchasing and supply chain management. As part of the program, I am currently undertaking research leading to the production of the research topic: *The Effectiveness of Government Policies in Reducing Environmental Impact in Agricultural Supply Chains. A Case of Mashonaland Central in Zimbabwe*. I am therefore seeking permission to conduct a survey of agricultural supply chains players from selected institutions directly involved in or affected by agricultural supply chains activities and environmental policies in the Mashonaland Central region. The objective is to explain the effectiveness of government policies in reducing environmental degradation in Mashonaland Central's agricultural supply chains by exploring implementation challenges, stakeholder roles, and proposing recommendations for sustainable practice. Your response is crucial in providing recommendations to enhance the environmental sustainability of Mashonaland Central Province agricultural supply chains.

Government stakeholders' categories will be analyzed including farmers, local government agricultural extension institutions, Environmental agencies, agricultural supply chain actors, government departments and research institutions. The purpose is to determine the rich information on their responsibilities in agricultural activities and environmental policies in Mashonaland Central Region.

Please feel free to include any additional comments you deem necessary or relevant to improving the information already available. Your response and time is greatly appreciated. Thank you!

Regards

Justin Nyagumbo

Signature.....

Approved/Not Approved (circle one) For and on behalf of your organization

Name.....Signature.....

Designation.....Date...../...../.....

**APPENDIX B: QUESTIONNAIRE FOR TOBACCO GOVERNMENT BODIES,
FARMER ASSOCIATIONS AND PRIVATE CONTRACTING COMPANIES**

SECTION A – B INSTRUCTION: Please tick (✓) the appropriate answer(s) where applicable and provide additional information where required.

SECTION A: IDENTIFICATION INFORMATION

1. Occupation:

Farmer ☐ Agricultural extension officer ☐
Provincial EMA representative ☐ Agribusiness stakeholder ☐
Ministry of Agriculture and Ministry/ Ministry of Environment officials ☐
NGO representative

SECTION B: DEMOGRAPHIC INFORMATION

2. Experience:

Less than 1 year ☐ 1-3 years ☐ 4-7 years ☐ 8-15 years ☐

More than 15 Years ☐

SECTION C – E NSTRUCTIONS

SECTION C – E insert a mark or tick in the relevant box showing the extent to which you (dis)agree with each of the statements. Indicate your response on a scale of 1-5 Likert scale as follows: *1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.*

SECTION C: EFFECTIVENESS OF EXISTING GOVERNMENT POLICIES

	Statements	1	2	3	4	5
C1	Our organization/farm is fully aware of the government environmental policies relevant to our agricultural operations.					
C2	Our organisation clearly understands the requirements and implications of these government environmental policies for our supply chain activities.					
C3	Our organization/farm actively implements practices to comply with government regulations on water usage in agriculture.					
C4	Our organisation regularly monitors our operations to ensure compliance with government policies on pesticide and fertilizer application.					
C5	Our waste disposal practices align with national environmental regulations.					
C6	Government policies on land use and conservation are effectively integrated into our operational planning.					
C7	Our organisation receives sufficient information and guidance from government agencies regarding environmental policy compliance.					
C8	The existing government policies provide clear incentives for adopting environmentally friendly practices.					
C9	Our organisation believe that current government enforcement mechanisms are effective in ensuring widespread adherence to environmental policies.					

SECTION D: CHALLENGES AND GAPS IN IMPLEMENTING SUSTAINABLE AGRICULTURAL POLICIES

3. To what extent do you (dis)agree with the following statements regarding the main challenges in implementing sustainable agricultural policies? Indicate your response on a scale of 1-5 Likert scale as follows 5 = *Strongly agree*; 4 = *Agree*; 3 = *Neutral*; 2 = *Agree*; 1 = *Strongly Disagree*.

	Statements	1	2	3	4	5
D1	Lack of Funding					
D2	Weak Policy Enforcement					
D3	Low Stakeholder Awareness					
D4	Limited Access to Sustainable Farming Inputs					

SECTION E: STAKEHOLDER ROLES IN ENVIRONMENTAL SUSTAINABILITY

	Resource Consumption and Efficiency	1	2	3	4	5
E1	We have significantly reduced our water consumption in agricultural production processes (e.g., irrigation, cleaning).					
E2	Our energy consumption from non-renewable sources in the supply chain (e.g., machinery, processing, transport) has notably decreased.					
E3	We have improved the efficiency of raw material use, leading to less waste during agricultural production and processing.					
E4	Our packaging materials are more resource-efficient (e.g., lighter, less material used).					
	Waste Management and Circularity	1	2	3	4	5
E5	We have significantly reduced the amount of agricultural waste (e.g., crop residue, organic waste) sent to landfills.					
E6	There has been a substantial increase in the recycling or reuse of materials within our agricultural supply chain operations.					
E7	We actively seek opportunities to convert agricultural by-products or waste into valuable resources (e.g., compost, bioenergy).					
E8	Our organization actively participates in schemes for the collection and recycling/disposal of agricultural plastics (e.g., mulching films, irrigation pipes).					
	Emissions and Pollution Control	1	2	3	4	5
E9	Our practices have led to a noticeable reduction in greenhouse gas emissions from our agricultural activities (e.g., from livestock, fertilizer use, energy).					
E10	We have effectively reduced the pollution of local water bodies (rivers, groundwater) from agricultural runoff (e.g., pesticides, fertilizers).					
E11	We actively implement measures to minimize air pollution originating from our agricultural operations (e.g., dust, burning).					
	Biodiversity and Land Use	1	2	3	4	5
E12	Our land management practices contribute positively to soil health and prevent soil erosion.					
E13	We implement measures that protect and enhance local biodiversity on or around our agricultural lands.					
E14	Our agricultural expansion or practices do not contribute to deforestation or habitat loss.					
	Chemical Use and Management	1	2	3	4	5
R15	We have reduced our reliance on synthetic pesticides and fertilizers through integrated pest management or organic practices.					
R16	The handling and disposal of agricultural chemicals are done in an environmentally responsible manner.					

Thank you for your time and participation!

APPENDIX C: INTERVIEW GUIDE FOR TOBACCO FARMERS

1. Are you aware of government policies aimed at mitigating environmental impacts in agricultural supply chains?
2. How effective do you think these policies are?
3. What are the key government policies addressing sustainability in agricultural supply chains that you are aware of?
4. Have these policies improved environmental sustainability in agriculture?
5. What specific environmental issues do you think require more attention in current agricultural policies?
6. What do you think are the key gaps in current policies?How can these challenges be addressed?
7. Do you believe stakeholder collaboration is effective in promoting sustainability?
8. How can stakeholder engagement be improved?
9. What policy measures can be introduced or improved to enhance sustainability in agricultural supply chains?
10. Do you believe incentives (such as subsidies, tax breaks) should be provided to encourage sustainable farming?
11. Any additional comments or suggestions on improving environmental sustainability in agriculture?

APPENDIX D: INFORMED CONSENT

You are being asked to participate in a research study entitled: *The Effectiveness of Government Policies in Reducing Environmental Impact in Agricultural Supply Chains. A Case of Mashonaland Central in Zimbabwe*. The purpose of the study is to explain the effectiveness of government policies in reducing environmental degradation in Mashonaland Central's agricultural supply chains by exploring implementation challenges, stakeholder roles, and proposing recommendations for sustainable practice.

As a participant in this study, you will be asked to fill out a questionnaire that has 20 questions. Finishing the questionnaire should take approximately ten minutes.

Your participation in this study is voluntary. If you sign the bottom of this Form, it means that you are giving your consent to be in the study. You will NOT be asked to write your name on the questionnaire and this Form is separate from the questionnaire—this ensures that your identity will not be revealed. No one, other than the researcher(s), will have access to the data and all data will be kept on a password-protected computer.

If you do not want to participate in the study, do not begin filling out the questionnaire or participating in other research activities. If you start to fill out the questionnaire and decide, you do not want to participate, stop filling it, out and give it to the researcher. There is no penalty for not participating and your questionnaire will not be used.

If you participate, you will contribute to knowledge about the effectiveness of government policies in reducing environmental impact in agricultural supply chains. There are no identifiable risks to you from participation.

The researcher will answer any questions that you have about the study and you should ask them now.

If you have complaints or concerns about this research, please contact the supervisor of the research.

Thank you.

Justin Nyagumbo, the primary researcher

By signing below, I agree to participate in this research.

Signature _____ Date _____