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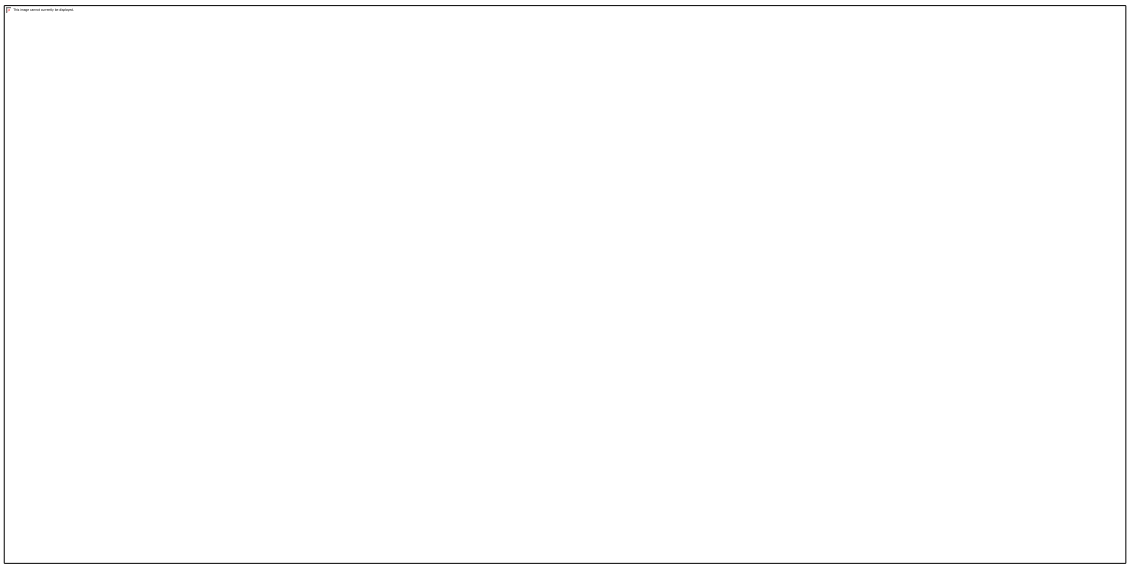

RESEARCH TOPIC

FACTORS AFFECTING SMALL GRAINS SUPPLY CHAIN IN ZIMBABWE: A CASE STUDY OF MASHONALAND CENTRAL PROVINCE.

BY OMEGA P MUDIU B212060B

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE ATTAINMENT OF A BACHELOR OF COMMERCE HONOURS DEGREE IN PURCHASING AND SUPPLY AT BINDURA UNIVERSITY OF SCIENCE EDUCATION, JUNE 2025.


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DEDICATION

This dissertation is dedicated to my father and my loving mother, whose daily prayers, and compassion have enabled me to achieve such accomplishment and honor. I also dedicate my work to my family members. You all have been a pillar of strength to me and you taught me the value of having a strong heart and mind. I pray for radical grace upon your lives. Thank you and may the lord richly bless you.

ACKNOWLEDGEMENTS

I would like to extend my sincere gratitude to Bindura University of Science Education for granting me the opportunity to pursue a Bachelor of Honours Degree in Purchasing and Supply. I am also deeply grateful to the lecturers who imparted their knowledge and guidance throughout the duration of this program. The skills and insights I have gained will undoubtedly remain valuable in both my personal and professional life. I would especially like to thank my family for their unwavering support financially, emotionally, and in terms of the time they sacrificed for me to complete this journey. Without their encouragement and belief in me, this achievement would not have been possible.

My heartfelt appreciation goes to Mrs. Ncube, who supervised this dissertation. Her guidance, patience, and constructive feedback were instrumental in ensuring that the research met the academic standards required by the Graduate School. To my fellow classmates and group members, thank you for your support and camaraderie. You reminded me to persevere even when I fell behind. Lastly, to my twin brother thank you for your love and understanding, especially during the many hours I was unavailable due to study commitments. Your patience and sacrifice mean the world to me.

ABSTRACT

In districts like Rushinga and Mbire, although small grains such as millet and sorghum grow under harsh conditions their supply is limited by poor infrastructure, affecting their role for food security for the locals. Forcusing on Mashonaland Central Province, this study examine specific supply chain drawbacks small grains stakeholders faces such as limited market reach and poor storage and suggesting relevent improvemnts to their challenges. The reseach used a quantitative research approach with gathered data from 55 key stakeholdrs including farmers, processors and traders or distributors using structured questinnires. The analysis was conducted using SPSS software and focused on variables such as infrastructure availability, market access, and institutional support. The respondents highligted that poor road networks, inadequate storage, and unreliable market continue to constrain the effective distribution of small grains in the province. Althouh government and NGO support exists, its impact remain limited and across many districts like Shamva and Mt darwin receiving mininimal asistance. To increase small grains contribution to food systems and availability the study sugested better rural roads, improved market acces and coordination among institutional support and other key stakeholders. The fundings outlines practical steps for local authorities and NGO to enhance the small grains supply chain in the provice.

ACCYOYNM

SCM	Supply Chain Management
NGO	Non-Governmental Organization
FAO	Food and Agriculture Organization of the United Nations
ZimStats	Zimbabwe National Statistics Agency
ZimVAC	Zimbabwe Vulnerability Assessment Committee
SPSS	Statistical Package for the Social Sciences
AHM	Agricultural Household Model
WFP	World Food Programme
AU	African Union

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CHAPTER I INTRODUCTION

1.1 Introduction

This chapter covers the background of the study, purpose of the study statement of the problem, objectives of the study, research questions, significance of the study, assumptions of the study, limitations of the study, delimitations of the study, and definitions of key terms.

1.2 Background of the Study.

In many dry regions across the globe, crops such as millet and rapoko are critical to households food supply especially during drought periods. Small grains are often cultivated in semi- arid regions where climatic conditions are unsuitable for larger cereal crops such as wheat and maize. In Global Agricultural supply chains, there is increasing interest in small grains due to their resilience to climate variability and their nutritional benefits (FAO, 2023). In developing countries, however, their supply chains remain underperforming due to inadequate infrastructure and limited integration of modern logistics (FAO, 2022).

Even with growing recognition of their nutritional value, climatic conditions, ability to promote food security and agricultural sustainability, farmers are often prefere commercially dominant crops like maize and wheat due to better market access and input availability (Baker, Smith, & Jones, 2020. Strengthening local and regional food systems through improved small grain supply chains can reduce dependency on imported cereals and enhance food security, this can be achieved

by integrating technology, innovative practices and farmer training (Thompson, Williams, & Green, 2019).

Across many rural communities in Africa including Mashonaland Central Province small grains are key to nutrition but face supply chain challenges due to poor road network and limited number of reliable buyers (Changalima & Ismail, 2022). The African Union (2020) continues to promote agricultural development through policies aimed at increasing productivity and enhancing value chains for the attainment of food security and fostering economic development across the continent. Collaboration among key stakeholders, including farmers, government, NGOs, processors and distributors is essential to build resilient and reliable supply chains for small grains. Initiations and policies like Zunde Ramabo scheme aimed to promote and improve small grains production, facilitate markets and enhancing crop resilience are essential to strengthen the supply of these small grains, but coverage is incositency especialy in remote areas.

In Zimbabwe, maize remains the dominant staple, but small grains such as millets are gaining an increasing attention due to their drought tolerance, nutritional benefits and contribution to food security. Various government programs by the Zimbabwean government, including the Presidential Input Scheme, have supported small grain cultivation, particularly in climate vulnerable areas (FAO, 2021). However despite these efforts, supply remains insufficient due to various factors which includes market and logistical constraints (Tavuyanago, Mutami, & Mbenene, 2022).

Zimbabwe's agricultural sector is very important to its economy contributing significantly to food security of the country, employment and source of foreign currency earnings (FAO, 2023). Small grain farmers are often small famers (village households) for their traditional rituals, beer brewers and domestic use (ZimStats, 2022) Smallholder farmers who dominate Zimbabwe's agricultural sector contribute significantly to source of income for the to rural communities and food production, however they often lack access to inputs, post-harvest infrastructure and markets (ZimStats, 2022; Gumbo, Moyo, & Nyoni, 2021). In regions such as Mashonaland Central, has

high potential of small grains production due to favorable climatic conditions in agro-ecological regions II and III (Moyo et al., 2024). However, their uptake remains low due to poor supply chain coordination and limited support services.

Mashonaland central province is in northeast region of Zimbabwe that falls within the Natural region ii and natural region iii according to Zimbabwe's rainfall regions (Moyo, 2000). These regions receive about 7500mm-1000mm and 500mm-800mm annually, making it suitable for intensive cropping for drought resistance crops such as millet, rapoko and sorghum (Moyo et al., 2024). With its significant potential in small grains production. Given its mix of productive and underdeveloped areas Mashonaland Central Province allows us to understand the actual challenges farmers and traders are facing when handing these small grains. Basing on the province's different agricultural activities, a careful understanding of its dynamic agriculture supply chain patterns can provide useful key areas for the development of strategies to improve the living standards of small grains farmers and offers a significance boost in agricultural production for small gains with in the country.

Understanding local agro-supply chain challenges such as infrastructure gaps, input shortages, and market barriers can help develop interventions to improve small grain production and distribution. Many farmers in the province operate at a subsistence level, limiting their ability and capacity to invest in technologies and improved practices (Gumbo et al., 2021). Individual small grain suppliers may struggle to archive economies of scale in marketing and production, a careful examination of these unique circumstances can foster a community engagement and cooperation that can lead to resilience small grains supply chains that benefits local players and enhance food security within the province. These challenges hinder the development of efficient supply chains that are crucial for achieving food security and economic resilience in rural areas.

1.3 Purpose of the Study.

This research aims to examine key factors that are affecting small grains supply chains with in Mashonaland Central Province, Zimbabwe and to propose data driven recommendations that are actionable to reduce those factors.

1.4 Statement of the Problem

Despite the inherent resilience of small grains such as millet, rapoko and sorghum to semi-arid regions conditions in Mashonaland Central, poor road access, uncompetitive pricing and erratic market demand continue to limit small grains ability to support rural livelihoods and food security within the country (Nciizah et al., 2021). Although efforts have been made by the government of Zimbabwe to distribute inputs through various schemes such as the Presidential Input Support Programme to promote farming and supply of these small grains, their productivity and supply chain performance remain underperformig (FAO, 2022). Despite small grains' nutritional benefits and resistance to drought conditions over maize, agricultural supply chains within the country seem to prefer maize as their staple crop (Moyo, 2020). Because there is little focused research on the country about the numerous factors affecting their supply chain, the local leaders and farmers may struggle to implement strategies to enhance those supply chains and provinces such as Mashonaland Central, which could have far-reaching consequences for household livelihoods and food security. As a result there is a pressing need to investigate factors that are affecting supply chains for these small grains and to propose practical and data-driven recommendations to improve food security and livelihoods in the country.

1.5 Objectives of the Study.

i. To identify the difficulties that are encountered by key stakeholders in small grains supply chains.
ii. To propose strategies that can be implemented to promote availability of small grains in agro-supply chains of the country.

1.6 Research Questions

i. What are the difficulties encountered by key stakeholders in small grains supply chains?

ii. What practical strategies can be adopted to improve the supply and accessibility of small grains?

1.7 Significance of the Study

This study could help district agricultural offices and other stakeholders refine their approach by identifying the exact causes of small grains problems in the province. Small grains farmers can play a pivotal role to Zimbabwean agricultural sector promoting reliance and robust food production during drought and periods of law rain falls and improved rural livelihoods (Phiri et al., 2019). This research seeks to examine and understand these factors that affect small grains supply chains and to determine recommendations that can be taken to reduce those factors on a specific condition of Mashonaland Central Province. Stakeholders in different districts face challenges that are different, which is why location specific findings was necessary. This research will cover the gap by providing detailed insights into the dynamics of their supply chain from inputs acquisition, production process to marketing and distribution. By identifying opportunities for the value addition and diversification within these supply chains, small grains can contribute to an improved livelihoods of key stakeholders and food security for the country (Phiri et al., 2019).

1.8 Delimitations of the Study

The study was delimited to specific context and unique characteristics of small grains agricultural supply chain conditions of Mashonaland Central Province in Zimbabwe. In addition this study was

conducted based on responses from key stakeholders of small grains supply chain within the province.

1.9 Limitations of the Study

The data collection technique was limited due to financial budget constraints however, family and friends assisted with reasonable funds needed to successfully carry out the study. The sample size may not provide the generalizability, as the focus on Mashonaland Central Province, Zimbabwe, may not represent the broader population. However, to overcome that the researcher used suitable sampling technique to ensure that sample is representative of the population.

1.10 Assumptions of the Study

This study was conducted based on several key assumptions. It assumed that the participants comprising farmers, traders or distributors, and processors provided honest and accurate responses to the questionnaire, reflecting their true experiences and perceptions. The research also assumes that the selected sample of 55 respondents is sufficiently representative of the broader population of stakeholders involved in the small grains supply chain within the province. It also assumed that the external environment during the period of data collection such as market conditions, government policies, and weather patterns remained stable enough not to significantly alter the responses. The study presumed that the respondents had a reasonable understanding of the questions asked and were willing to participate without coercion.

1.11 Definition of Key Terms

i. Small grains: refers to crops which are for food security and nutrition such as sorghum, rapoko and millet (Hodges, 2011).

ii. Agricultural supply chain: referrers to interconnectivity of process, activates and individual or organizations involved in the movement of farm produce from the initial farming stages such as acquiring of inputs to the delivery of products to consumers (Parwezi, 2022).

iii. Key stakeholders: these are individuals or groups directly involved in the small grain supply chain such as farmers, processors, transporters and distributors (traders and market intermediaries) (Freeman, 1984).

iv. Food security: is the accessibility and availability of food, particularly regarding the role of small grains in ensuring sufficient nutrition (FAO, 2020).

v. Smallholder farmers: these are small-scale farmers that often rely on family labor who cultivates relatively small are of land (FAO, 2020).

1.12 Chapter Summary

This chapter included the background information of the study, the problem statement, purpose of the study, purpose of the study and the research questions. The limitations of the study, delimitations of the study and definition of key terms were also included in this chapter.

CHAPTER II LITERATURE REVIEW

2.1 Introduction

This chapter covers the theoretical framework which includes the agricultural supply chain theory, and the house hold model. The concept of agricultural supply chain is also covered it the conceptual framework of this chapter, as well as empirical reviews on challenges affecting small grans supply chain stake holders, the small grains production and the measures that can be implemented to promote the availability of small grains in Zimbabwean agriculture supply chains. The research gape is also discussed in this chapter.

2.2.0. Theoretical Framework

2.2.1. The Supply Chain Management Theory (SCM)

Supply chain management theories emphasize the need for collaboration among various stakeholders involved in agricultural activities from production to distribution (FAO, 2023). SCM theory focuses on the management of supply chains to promote resilience to factors that might affect the smooth flow of small grains. A supply chain is a connection of people, organizations, activities, resources and information involved in the delivery and production of a service or a product (Christopher, 2016). The goal of SCM is to coordinate and intergrate the different processes and activities within the supply chain to gain a competitive advantage. Agricultural supply chains consist of production, distribution and processing of agricultural products, and are often recognized by its unpredictable weather and transport delays makes it fragile, complexity

and variability (Ahumada & Villalobos, 2009). Aagricultural supply chains can be managed and developed to improve quality, reduce cost and increase resilience to changing market environment.

In the context of small grains, effective SCM can reduce post-harvest losses and ensure that farmers receive competative prices for their products. Researchers highlights that integrating smallholder farmers into broader supply chains can promote their market access and improve overall livelihoods for locals (Fambidzanai Permaculture Centre, 2023). Advanced use of technology in small grains supply chain, such as digital platforms for market information, can promote effective communication among supply chain stakeholders (Kumar, 2024). By providing data on prices and demand in real- time , these technologies can facilitate farmers to make informed decisions about where and when to sell their grains, resulting in increased resilience to drawbacks affecting their supply chain (FAO, 2021). The SCM theory emphasizes the importance of managing the flow of goods, services, and information from raw materials to end customers (Christopher, 2016). This theory highlights all the activities within the supply chain systems of small grains, this as a result will enable stakeholders to clearly recognize factors affecting their supply chain. This helps to make sure that smallholder farmers receive competitive and fair prices for their produce and to promote food security across the country.

The agricultural supply chain stakehollders are coordinated through downstream and upstream relationships, they can engage in different kind of relationships to secure access to and flow of agricultural products (OECD/FAO, 2016), for example contract farming or joint venture and accusations. The agricultural supply chain can be illustrated by the diagram below (fig 1). The agricultural supply chain is exposed to various challenges, including weather and climate, market fluctuations and government regulations and policies (Kumar, 2024). Climate change and weather-related affecting operations and the productivity of farmers, where as trade agreements can be affected by government policies and regulations such as food safety regulations and price and market fluctuations can affect the product availability and stakeholder participation.

Figure 1. Agricultural supply chain network. Source Matopolous, Viachpoulou, Mathou and Manos (2007).

2.2.2 The Agricultural Household Model (AHH)

This model focuses on the importance of understanding the social and economic factors that influence the decisions to produce certain crops by farmers (Singh et al., 1986).The AHM consists of various key components including non-farm and farm activities for labor allocation, savings, consumption and risk management, where sources of income for the local household are from (Lanjouw and Lanjouw, 2001). The smallholder farmers are considered as the primary producers of small grains in Zimbabwe and this model can be used to analyze decision making behavior for smallholder farmers in their day to day farm life (FAO, 2021). This model focus on labor allocation, it is very crucial for understanding how these farmers allocate their resources between non-farm and farm activities which can significantly affects their ability and choices to produce small grains.

This model emphasizes on the need to understand the factors that influence decisions to produce small grains by smallholder farmers. The AHM as show by the diagram below (figure 2) takes into consideration the fact that farmers are not just producers of crops, but also consumers of goods and services (Singh et al, 1986). For example producer might stop producing millet if the fertilizers prices rise or if they can sell their harvest at a good price from local markets (FAO, 2021). The AHM also has important implications for policy development for supporting smallholder farmers and promoting their need to produce those small within the province. By examining and understanding the factors that influence farmer's decision-making, policymakers can come up with more rebust strategies to support smallholder farmers and significantly improve the overall efficiency of the supply chain (CABI, 2022). Tampuboln, (2018), as described the farm househod model as open system that can be influence by political environent, natuaral environment and socialcutural environemt.

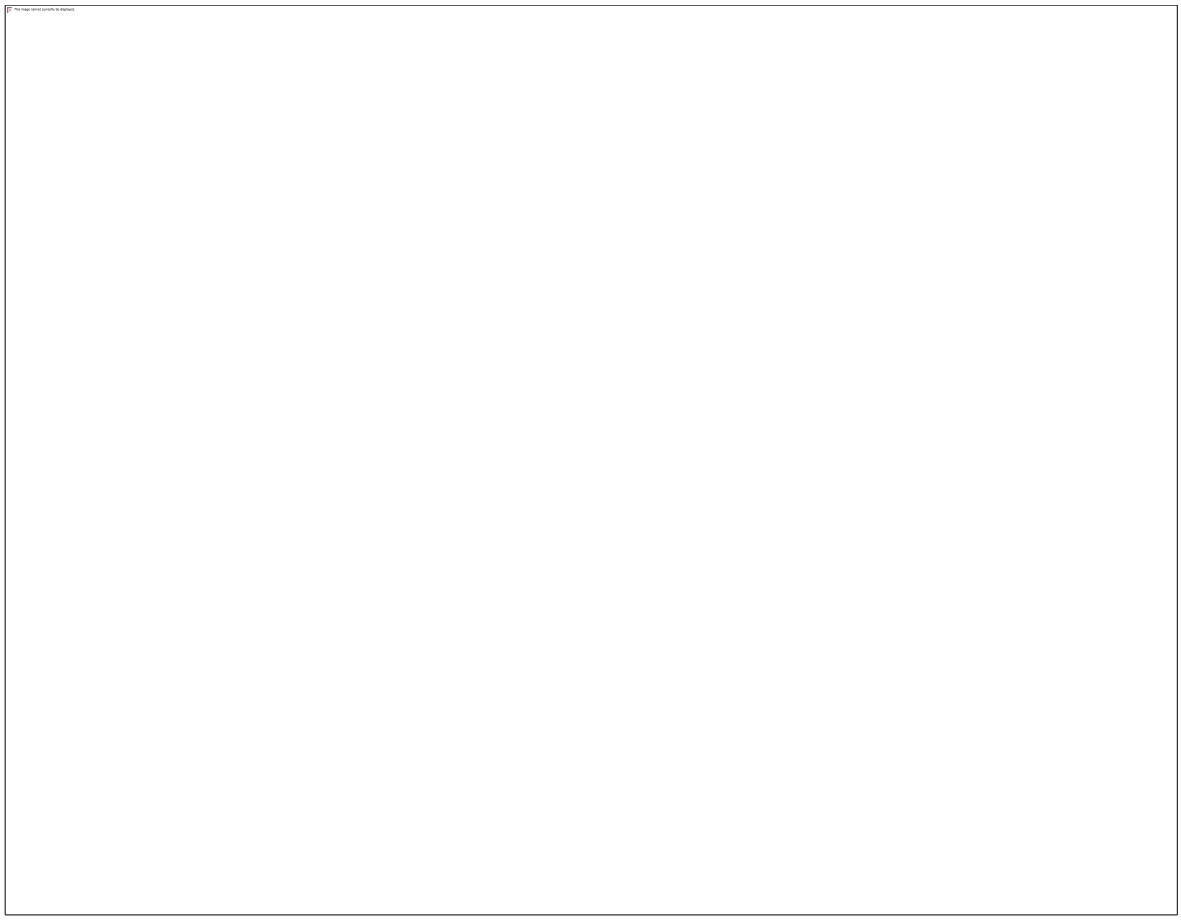

Figure 2 Farm House Hold Model, Source; Jonkers Tamubolon (2018)

2.3The Empirical review

2.3.1 Small Grains Supply Chain in Zimbabwe

Zimbabwe's small grains involves various stakeholders and activities which start from sourcing of inputs to the distribution of final products to final consumers, its stakeholders, including farmers, traders, processors, transporters and final consumers (ReliefWeb, 2022). The supply chain begins with farmers, who produce small grains, and ends with consumers, who purchase the produce from markets or retailers. Zimbabwe is a significant producer of small grains in Southern Africa, with

crops like rapoko, millet, and sorghum being crucial for food security and economic development for the country (FAO, 2020).

Researchers like Moyo (2020) and Chisango (2022) have emphasized the importance of small grains in Zimbabwe's agricultural landscape especially as a response to food insecurity due climate change in the country. The small grains agricultural supply chain in Zimbabwe is known by various challenges, including finance shortags, limited access to markets and infrastructure inadequacy (Fambidzanai Permaculture Centre, 2023). Smallholder farmers who are known to be primary producers of small grains face multitude of difficulties in accessing markets due to poor road infrastructure, lack of market information, and inadequate transportation (FAO, 2023). Traders and processors also face challenges in the small grains supply chain, including poor storage facilities, high transaction costs, and limited access to finance (Moyo, 2019). There is need to examine and understand the unique channels in which small grains in Mashonaland Central Province goes through and their specific challenges associated, given recent reseaches were more forcused in other provinces such as Matebeleland and Manicaland provinces other countries such as Tanazania.

2.3.2 Challenges Encountered by Key Stakeholders in small grains supply chains.

Studies and field interviews shows that small grains supply chain in Zimbabwe is prone to a multitude of difficulties encountered by key stakeholders. One of the primary and major difficulties faced by smallholder farmers is limited access to markets (FAO, 2023). Various smallholder farmers in Zimbabwe face difficulties in access to formal markets both local and international markets, which as a results they sell their produce on their door-step traders with less competitive prices (Phiri, 2019). As established by FAO,(2021), another difficulty faced by smallholder farmers is limited access to finance, and other financial services from commercial banks due to lack of collateral security, which makes it difficulties for them to invest more in their farms and improve their operations (FAO, 2023). Traders or market intermediaries and processors also face difficulties in the small grains supply chain, including inadequate storage facilities, high

transportation costs to connect with remote farmers and limited access to latest farming technologies (Moyo, 2019).

The difficulties encountered by key stakeholders in the small grains supply chain in Zimbabwe can also be as a result of several factors, including inadequate government support, poor market research, and other social-economic factors (Phiri, 2019). Zimbabwe's supply chains are characterized by number of door-step buyers involved which reduces the profitability of smallholder farmers by selling their grains at manipulative market price because farmers cannot access formal markets or negotiate for better prices (Nciizah, 2021). The SCM theory emphasizes the importance of promoting the clear movement of goods, information and services, from raw materials to end customers (Lambert and Cooper, 2000). However, some of these reviews were based on information collected from other parts of the country such as Zvisavane district, there is need to focus on Mashonaland Central Province to accuretly understand the challenges they are facing in that distinguished province with unique agricultural characteristics.

2.3.3 The Small Grains Production in Zimbabwe

Recent literature have discussed that the small grains agricultural supply chain is significantly affected by the shortage of supply of these crops, one of the major primary reasons is the low production of small grains due to low yields, high production costs for small holder famers and low profitability (Phiri, 2019). Small grains production is known for being labor-intensive and farmers tends to prefer other crops that require less labor (Fambidzanai Permaculture Centre, 2023). Climate change also plays a significant factor that affects small grains production, unpredictability of rainfall patterns and increased temperatures can lead to lower quality produce and reduced yields making difficult and less profitable for farmers to produce small grains (Relief Web, 2022). The limited government support programs and inadequate infrastructure development can also contribute to the law production of small grains (Muzerengi and Tirivangasi, 2020).

Production shortages of small grains is as a result to several reasons including the lack of economic incentives, limited or no access to latest agricultural technologies and limited access to markets and financial services (Phiri, 2019). The small grains supply chain in Zimbabwe is characterized by numerous middlemen which increases transaction costs and reduces the profitability of smallholder farmers (ActionAid, 2020). The agricultural household model shows the importance of understanding and analyzing the economic and social factors that influence decisions that farmers make to produce certain crops. There is need for a focus on the specific reasons that are resulting in farmers in Mashonaland Central Province not producing small grains, regardless of the support they receive from the national government and the suitability of thier climactic conditions for the growing of these crops (Nciizah, 2021). This can help create recommandatins that can be used by policy markers and government to make informed decisions and provide them with exactly support they need and improve countries food security.

2.3.4 Strategies that can be implemented to Promote Availability of Small Grains in Zimbabwean Agricultural Supply Chains

Literature shows various strategies that can be implemented to promote small grains production and smooth movement within the agriculture supply chain. One approach is the establishment of formal markets to improve access to markets by smallholder farmers and the provision of market information can also help to improve small grains supply chains (Muzerengi and Tirivangasi, 2020). Training and extension services to farmers to improve their productivity and resilience, this can include training on small grains production and handling to avoid post-harvest loses, as well as the use of technology, such as mechanized equipment and irrigation systems (Nciizah, 2021). World Bank in 2010 held a workshop for reducing post-harvest losses in grains supply chains in Africa at FAO headquarters in Italy, the purpose of the workshop was to identify appropriate future inventions in Sub-Sahara African. A number of inventions were identified and the first priority was given to support for uptake technologies for drying, harvesting, primary processing and storage for small grains (Relief Web, 2022)

Moreover, the private sector and government can invest in storage facilities, roads, infrastructure development and transportation systems, to improve the connectivity within the supply chain and reduce transaction costs (Moyo, 2019). SCM theory, can be used to evaluate and understand ways to promote small grains agriculture supply chain (CABI, 2021). To address unique challenges thare are being faced by Mashonaland Central Province small grains supply chain stakeholders, there is a need for tailored research on best solutions to help smooth movement of small grains in their unique challenges.

2.3.5 Market Demand for Small Grains in Zimbabwe

There has been a shift towards the production of small grains such as millet, sorghum and rapoko in Zimbabwe, this shift is largely driven by climate change which has made the cultivation of maize less successful in several parts of the country. The country witnessed a 146% increase in sorghum production and a 106% rise in finger millet output between 2018 and 2023 (Milling Middle East & Africa Magazine 2024). This change was also supported by government programs aimed at promoting food security through the Presidential Input Scheme. In the Midlands province, over 30,000 hectares have been put aside for production of small grains through targeted support programs (Chitumba, 2024). However, the market for small grains are still faceing number of supply-side drawbacks such as poor post-harvest infrastructure and the high labor intensive harvesting. Nonetheless, the increasing demand from institutional buyers such as schools and hospitals, urban and rural consumers indicates a positive growth parth. The Zimbabwe Commercial Farmers Union has noted an increase indemand for traditional foods, as a result for vendors and urban restaurants embracing small grains into their offerings (Milling Middle East & Africa Magazine, 2024). Despite the shift consumers who shows interest in purchasing these small grains often find it difficult to access or more expensive than maize, due to inadequate balance between supply and demand (Phiri, 2019).

Hospitals such as Parirenyatwa Group of Hositals have started incorporating rapoko (finger millet) into patient daily meal as part of health-centered dietary reforms and this could boost demand if peole associate small grains with health benefits (New Ziana, 2023). The potential for expanding small grains markets into Zimbabwe's urban areas is high, due to rising consumer health awareness and for traditional foods (Muzerengi and Tirivangasi, 2020). Additionally, diaspora Zimbabweans comming home often seek these grains, resulting to niche market in urban centers. while demand is increasing, many smallholder farmers in the country are reluctant to grow small grains due to high labour cost and exploitative prices offered by door step buyers and the lack of guaranteed markets by the government (Phiri, 2019).

2.3.6 Resilience of the small grains Supply Chain to Shocks

The small grains supply chain in Zimbabwe demonstrates a significant level of resilience, in response to climate shocks like drought particularly. These grains are suiteble to arid and semi-arid regions, requiring less rainfall than maize and maturing faster, which makes them ideal for droughts and erratic rainfall patterns. However, other shocks like inflation policy inconsistency and infrastructure decay pose substantial threats. This affects input prices, market prices and transportation costs, making it difficult for key stakeholders to maintain a steady participation in the small grains supply chains (Fambidzanai Permaculture Centre, 2023) Smallhoder farmers arevstill rely on manual labor for harvesting becouse the absence of small grain-specific machinery, this discourages expansion (The Herald, 2023). Zimbabwean government have started initiatives for small grains not only as traditional crops but as staples that can ensure adequte food supply and reduce food imports (Milling Middle East & Africa Magazine, 2024). If these systemic gaps are effectively addressed, these small grains can be regarded as both a heritage crop and a cornerstone of Zimbabwe's food system.

2.3.7 Small Grains value chain in Zimbabwe

Small grains supply chain value in Zimbabwe is primarily added by farmers at the post-harvest stage where basic processing, such as drying, packaging and milling. Farmers then typically sell those grains in raw form to local buyers or middle man who transport the grains to small-scale milling operations or market. These middle actors becouse of their access to transportation, buyers in urban markets and storage captures a significant portion of value (New Ziana, 2023). However, the value addition remains insiginificant due to inadequte infrastructure and lack of capital, despite growing consumer demand for healthy traditional foods, much of the value remains unexploited, especially in marketing and processing where the supply chain could change from being farmer-led to enterprise-driven (Fambidzanai Permaculture Centre, 2023).

There are significant opportunities for value addition in Zimbabwe's small grains supply chain. Increasing investment in small to medium sized milling and processing plants near production areas to reduce post-harvest losses and create employment while reducing transport costs. (Phiri, 2019). Investment in packaging and branding can boost market visibility, particularly in diaspora and urban markets that consume traditional foods for both cultural and health reasons branding can also attract health-conscious customers by highlighting the nutritional benefits for conditions such as diabetes, and hypertension (Milling Middle East & Africa Magazine, 2024). To achieve this, small grains supply chain stakeholders should address gaps in , machinery, technical knowledge and marketing skills. Government extension services, community engagement and private-sector partnerships can play a significant role here, by supporting entrepreneurs to create branded small grain products ideal for retail shelves locally and internationally markets. (Nciizah, 2021).

2.4 The conceptual framework.

The conceptual framework for this study was developed to provide a structured display of key factors influencing the small grains supply chain in Mashonaland Central Province, Zimbabwe. This framework was built around the central assumption that the performance and availability of

small grains in the region are influenced by three interconnected variables of factors (Muzerengi and Trivangasi, 2020), as shown by the diagram below (figure 3). These variables factors include independent variables, mediatory variables and dependent variable to produce a desired output from the process (ReliefWeb, 2022).

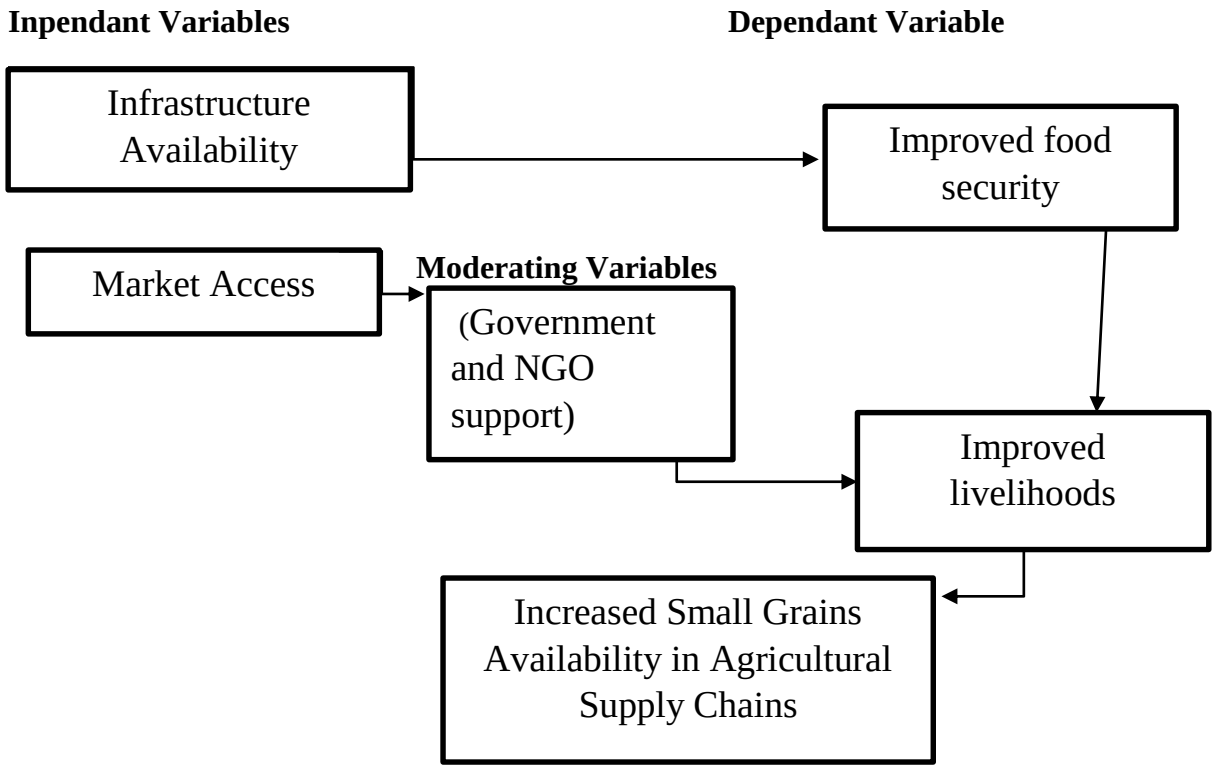

Figure 3 Conceptual framework

As illustrated by the above diagram (Figure 3) the relationship between variables influencing the performance of the small grains supply chain in Mashonaland central Province. At the core of the framework there are two key independent variables (infrastructure availability and Market access), for the efficient movement of small grains from producers to market and to trade or sell small grains at fair prices. These two variables are expected to influence the performance and outcomes of small grains supply chain. However the impact of these variables can be altered by a moderating

variable (Government and NGO support). These support can weaken or strengthen the relationship between infrastructure or market access and the resulting outcomes depending on their coverage and effectiveness. The relationship between these variables leads to three dependent variables (improved food security, improved livelihoods and increased availability of small grains). Reliable availability of small grains, reduced post-harvest loss, improved market access and stronger infrastructure can lead to increased production, consistency, increased income and enhance household food stability.

To strengthen the foundation of this study, the literature review incorporated empirical findings from previous research conducted both within Zimbabwe and in similar agro-ecological contexts in Sub-Saharan Africa. Studies by Phiri, (2019), FAO (2022), and Moyo, (2024) provided evidence-based insights into the challenges faced by smallholder farmers, such as limited market access, inadequate infrastructure and insufficient institutional support. These empirical observations directly informed the selection of variables in this study, particularly those relating to infrastructure availability, market dynamics, and external interventions by government or NGOs. Furthermore, findings from ReliefWeb (2022) and Chikozho (2023) helped establish the relevance of regional variations in supply chain efficiency, reinforcing the rationale for selecting Mashonaland Central Province as a unique case study. By grounding the conceptual framework in prior empirical evidence, this research aims to ensure that its focus areas are not only theoretically sound but also practically significant.

2.5 Research gap

While several studies have looked at small grains nationally, few have focused on specific provinces like Mashonaland Central where conditions vary greatly. The studies often overlook the geographical differences within small grains supply chain communities, which can have significant impact on decision-making processes and access to resources (Kassie, 2021). Addressing these gaps is crucial for developing a more comprehensive approach, eleminate and understand these factors that are affecting small grains supply chains in Mashonaland Central Province. These literature on the small grains supply chain in Zimbabwe emphasized the

challenges faced by smallholder farmers, including limited access to markets, finance, and inadequate infrastructure (Relief Web, 2022). However, there is a need for further research to evaluate and examine factors that affect the small grains supply chain in Mashonaland Central and to explore customized strategies that can be used to reduce these factors affecting smalls grains production and smoothing movement within the agriculture supply chains of the country, to improve food security and improve livelihoods for key stakeholders in the province.

2.6 Chapter Summary

In this chapter the significance of the sources on the factors affecting small grains supply chain in Zimbabwe were reviewed. The theoretical framework which includes the agricultural supply chain theory and the house hold model were also discussed. The conceptual framework of this chapter and empirical reviews on challenges affecting small grans supply chain stakeholders, the small grains production and the measures that can be implemented to promote the availability of small grains in Zimbabwean agriculture supply chains were also discoursed in this chapter. The research gape is also discussed. The following chapter of this research will discuss the research methodologies.

CHAPTER III RESEARCH METHODOLOGY

3.1 Introduction

In this chapter, the researcher outlines the various research methodologies employed in the study. This includes a discussion of the research paradigm, research design, target population, sampling techniques, research instruments, data analysis methods, as well as the validity and reliability of the data and ethical considerations.

3.2 The Research Paradigm

This study adopted a positivist approach. Positivism rests on the assumption that reality exists independently of human perception and can be observed, measured, and quantified objectively. In this paradigm, findings are obtained through the collection of empirical evidence using direct measurement tools (Creswell, 2014; McCombes, 2022). Considering the focus on factors influencing the small grains supply chain in Mashonaland Central Province, positivism was deemed suitable as it allows for the identification, measurement, and analysis of different influencing elements. The application of closed-ended questionnaires enabled the researcher to gather structured quantitative data, which could then be objectively examined using statistical techniques. To minimize bias, the researcher made a conscious effort not to influence participants' responses for instance, by explaining the questionnaire clearly while avoiding leading or suggestive language (McCombes, 2022). The aim was to produce findings that are generalizable beyond the sample group, thereby contributing to a broader comprehension of supply chain issues in the province and Zimbabwe at large. Therefore, the positivist approach supported the pursuit of accurate, replicable and unbiased knowledge aligned with the study's objectives.

3.3 Research Design

The research design outlines the methods and strategies the researcher used to collect and analyze data in addressing both the research question and the research problem, as asserted by McCombes (2022). Since this is a descriptive study, it aims to explore, examine, evaluate and provide recommendations regarding the specific variables identified in the research objectives. The goal was to gain insight into the practical challenges affecting the small grains supply chain in Mashonaland Central Province, Zimbabwe, while offering actionable suggestions for stakeholders to enhance the efficiency of the supply chain. In turn, this contributes to strengthening food security and livelihoods in the country. This research also supports national efforts focused on improving food availability, economic resilience and advancing National Sustainable Development Goals.

A quantitative approach was selected to gather data that could be statistically analyzed, largely due to the study's limited timeframe and available resources. Positivism emphasizes gathering numerical data and interpreting it through statistical methods with the aim of discovering patterns that are broadly applicable to human behavior and social systems (Takaza, 2023). This method allows for the identification of the key factors influencing the small grains supply chain in Mashonaland Central Province, while also creating a foundation for deeper insights into agricultural sector challenges. By relying on current and credible data, the research is positioned to provide well-grounded recommendations to support effective decision-making among critical players in the agricultural supply chain.

Empirical research enabled the study to reference findings from other scholars and use those insights as factual support for analyzing its own collected data. The study applied a case-study design to facilitate the collection of quantitative data, which was then examined through statistical techniques. A survey was adopted as the main method of data collection, as it aligns well with descriptive research and is effective in obtaining measurable information from a broad and varied group of stakeholders. Given the study’s objectives, surveys made it possible to gather uniform data from key participants such as smallholder farmers, traders, processors and distributors. Closed-ended questionnaires were used to collect precise, quantifiable responses, making them

suitable for analysis in SPSS. This method also ensures consistency in responses and reduces potential bias, which aligns with the positivist paradigm that prioritizes objectivity and the generalization of findings.

3.4 Case Study Area (Mashonaland Central Province)

This research was conducted in Mashonaland Central Province, situated in the northern region of Zimbabwe. The province comprises several districts namely; Bindura, Guruve, Mbire, Rushinga, Shamva, Muzarabani and Mount Darwin, each possessing distinct agro-ecological and socio-economic features (ZimVac, 2023). The researcher selected Mashonaland Central as the case study area because it includes productive regions such as Rushinga and Mbire, which have high potential for small grain cultivation, thus offering a comprehensive perspective on supply chain issues (FAO, 2023). These small grains are well adapted to the semi-arid climate and erratic rainfall patterns commonly experienced in many parts of the province. According to the Zimbabwe Vulnerability Assessment Committee (ZimVAC, 2023), food insecurity remains a critical concern in Mashonaland Central. This further justifies its selection as a suitable location for the study. Additionally, the province offers a strategic setting for analyzing supply chain challenges due to its geographical diversity and varying infrastructure levels. While some areas benefit from relatively well-developed road networks and grain storage facilities, others still face significant infrastructural limitations. This contrast allows for a balanced examination of both the opportunities and constraints within the small grains supply chain in the region.

3.5 Target Population

The research population refers to the complete set of individuals, groups, or entities that exhibit specific characteristics relevant to the study (Willie, 2024). In this research, the focus was placed on small grain farmers as well as other major stakeholders directly involved in the small grains supply chain. These included actors from the input acquisition stage to the final distribution, such as transporters, processors, traders, market intermediaries, and distributors. According to the Zimbabwe Vulnerability Assessment Committee (ZimVac, 2023), there are 282 key participants involved in the small grains sector within Mashonaland Central Province—comprising 216 producers and 66 other stakeholders. Based on this known population, a sample size of 55

respondents was determined. The calculation was done using Cochran's formula for finite populations, applying a 10% margin of error, 90% confidence interval, and an estimated proportion (p) of 0.5. The sample size was calculated using Cochran's Formula, where Sample size X=(Z^2 * p * (1-p) * N) / ((N - 1) * e^2 + Z^2 * p * (1-p)) if the population size is known, where:

- N = population size (282),
- Z = z-score corresponding to the 90% confidence level (1.645),
- e = margin of error (0.1),
- p = estimated proportion of the population with the attribute of interest (0.5).
- Sample size X = (Z^2 * p * (1-p) * N) / ((N - 1) * e^2 + Z^2 * p * (1-p)).
- X = (1.645^2 * 0.5 * (1 - 0.5) * 282) / ((282 - 1) * 0.1^2 + 1.645^2 * 0.5 * (1 - 0.5)).
- X = 54.74.

The result of approximately 55 respondents was therefore deemed suitable, based on Cochran's formula for finite populations.

To ensure balanced representation, the researcher included participants from each category of stakeholders. Questionnaires were administered to small grain farmers, processors, distributors and market intermediaries. Each respondent contributed essential information to support the study's goals and strengthen the validity of the findings.

3.6 Sampling Technique

A sample refers to a smaller, manageable subset drawn from the target population, used by researchers to collect data and make generalizations about the entire group (Willie, 2024). This study employed purposive sampling to select its participants. This non-probability sampling approach involves selecting individuals based on specific characteristics or professions relevant to the research aims (Creswell, 2014). The purposive sampling method was chosen because it enables the collection of rich, detailed information from individuals who possess direct knowledge and experience of the small grains supply chain in Mashonaland Central Province. Participants such as

small grains farmers, traders or distributors and processors were intentionally selected due to their roles, involvement and expertise in the supply chain. Purposive sampling was considered suitable for this study because it is ideal when the research seeks to explore the views of a particular group with specialized insight into the topic under investigation (Creswell, 2014). The researcher made sure that each category of stakeholder was adequately represented to ensure fairness, inclusivity and consistency throughout the study. A total of fifty-five (55) participants were selected and questionnaires were administered either in person or online, depending on the availability and accessibility of the respondents.

3.7 Data Collection Methods

Data for this study were collected using closed-ended questionnaires, as this format allowed respondents to provide quick answers without requiring written explanations. This method aligns with the quantitative research approach, which is well-suited for collecting standardized data across a diverse range of participants. It also facilitates generalization of findings and supports statistical analysis (Creswell, 2014).

3.8 Research Instruments (Closed-Ended Questionnaire)

A research questionnaire is a tool made up of structured questions designed to collect information from participants during a statistical survey (Wikipedia, 2023). In this study, the primary instrument used for data collection was a closed-ended questionnaire. The researcher selected this tool because it allows for the collection of uniform and well-structured responses that are ideal for statistical analysis (Creswell, 2014). For a study examining the factors influencing the small grains supply chain in Mashonaland Central Province, closed-ended questionnaires were particularly appropriate for several reasons. Firstly, they minimize interpretation errors and promote consistency, especially when collecting data from individuals with diverse backgrounds (Field, 2018). Secondly, they simplify the process of quantifying opinions and experiences related to the challenges within the supply chain. Additionally, this format supports the generalization of

findings and ensures that the data collected aligns directly with the research questions, thereby increasing the reliability of the analysis (Bryman, 2012).

The questionnaire was divided into key sections: Demographic Information, covering age, location and the participant's role within the supply chain. Scale-based questions using a Likert format (ranging from strongly agree to strongly disagree), which assessed perceptions and challenges affecting the supply chain To enhance clarity and accessibility, the questionnaire was written in plain English and designed to be easily translatable into the local languages spoken within the province. This helped avoid confusion and reduced the risk of biased or misinterpreted responses. Distribution of the questionnaires was done through face-to-face interactions and online platforms, depending on each respondent's availability. Prior to the main data collection phase, a pilot test was conducted to confirm the reliability, validity and clarity of the questions. The data collected were later analyzed using statistical software to identify key patterns and trends among the factors affecting the small grains supply chain in the province.

3.9 Measurement of Variables

To ensure the collection of reliable and quantifiable data, the questionnaire utilized a Likert scale. This approach allowed the researcher to measure how strongly participants agreed or disagreed with key statements related to specific challenges in the small grains supply chain. The Likert scale ranged from Strongly Disagree (1) to Strongly Agree (5) and was chosen for its effectiveness in capturing the extent of agreement among respondents on various issues and opportunities within the supply chain. This measurement design was particularly suitable for comparing perceptions across different stakeholder groups, including processors, farmers and traders or distributors involved in the small grains supply chain. All variables were measured through statements grounded in practical, real-life experiences relevant to the participants. For instance, independent variables such as market access and infrastructure availability were assessed using statements related to the presence of storage facilities and availability of reliable buyers. Moderating variables such as the level of government and NGO support were measured based on participants' views regarding the effectiveness of institutional programs that assist in the production and marketing of

small grains. By relying exclusively on Likert scale items, the study ensured the generation of a consistent and statistically analyzable dataset, while still allowing participants to express varying degrees of agreement or disagreement with key issues and proposed solutions in the small grains supply chain.

3.10 Data Analysis

The study utilized both descriptive tools and explanatory language to interpret and present findings generated through the Statistical Package for the Social Sciences (SPSS) software. SPSS was used to analyze the collected data and generate statistical outputs, including frequency distribution tables, pie charts, and bar graphs. These visual and numerical outputs were essential in understanding and illustrating the measurable factors influencing the small grains supply chain in Mashonaland Central Province, Zimbabwe.

3.10.1 Quantitative Data Analysis

Descriptive statistical methods were applied to analyze the quantitative data collected. The researcher used SPSS to summarize the demographic profiles of respondents and examine various factors impacting the small grains supply chain. The analysis involved computing frequencies, percentages, means and modes, which offered a detailed view of the participants' responses. SPSS was instrumental in converting the raw data into interpretable formats. The results were visually presented through pie charts, bar charts, tables and graphs, showing the frequency of responses within different categories. These methods made it easier to detect trends, compare stakeholder perceptions and provide a data-driven understanding of the challenges and opportunities affecting the supply chain.

3.11 Reliability and Validity of the Data

Reliability and validity are essential concepts in research methodology that ensure the quality and trustworthiness of the data gathered during a study (Wikipedia, 2023). Together, they strengthen the credibility of research findings, making them especially important for this study on factors

affecting the small grains supply chain in Mashonaland Central, Zimbabwe. These measures were critical in preventing biased or inaccurate responses that could compromise the study's outcomes.

3.11.1 Reliability

Reliability refers to the consistency and stability of a measurement tool, meaning that if the tool is used repeatedly under the same conditions, it will produce similar results (Creswell, 2014). In this research, reliability was enhanced by using closed-ended questionnaires with a standardized order of questions, promoting uniformity across all participants (Scribbr, 2021). Before the main data collection, a pilot study was conducted with a small group of stakeholders such as farmers and traders. Feedback from this pilot helped clarify any ambiguous questions. By standardizing the data collection instruments and procedures, the study aimed to increase internal consistency and ensure that the findings could be reliably reproduced under similar circumstances (Scribbr, 2021).

3.11.2 Validity

Validity concerns the accuracy and appropriateness of the conclusions drawn from the measurement, indicating whether the research truly assesses what it intends to measure (Creswell, 2014). The questionnaire items were designed based on insights from the literature review and guidance from academic supervisors to cover all critical aspects of the small grains supply chain, thereby enhancing the study's validity. The data collection instruments were reviewed by supervisors and peers to confirm that the questions appropriately reflected the concepts they aimed to measure on the surface level. Moreover, the questions were directly tied to the key variables identified in the conceptual framework. Although the study primarily uses quantitative data, the questionnaires helped verify the data collected and support the overall validity (Field, 2018). Efforts were also made to minimize measurement errors by using straightforward and clear language in the questionnaires to reduce the risk of misunderstanding by respondents.

3.12 Ethical Considerations

Ethical considerations play a vital role in safeguarding the rights of participants and maintaining the integrity of the research process. In examining the factors affecting the small grains supply chain in Zimbabwe, the researcher adhered to several key ethical principles to ensure fairness, respect and transparency throughout the study. These principles included obtaining informed consent from all participants, protecting their confidentiality and privacy, showing respect for their rights, declaring any potential conflicts of interest, minimizing risks and avoiding deception and securing permission to conduct the research and access relevant sites.

3.13 Chapter Summary

This chapter covered the research paradigm, research design, target population, sampling techniques, research instruments, data analysis methods, as well as the validity and reliability of the data, and ethical considerations. The next chapter will focus on analyzing, discussing, and presenting the findings and observations gathered through these research methodologies.

CHAPTER IV DATA PRESENTATION, ANALYSIS AND DISCUSION

4.1. Introduction

The study's analysis, discussion and presentation of data were all covered in this chapter. The data was analyzed with the help of a Statistics Package for Social Science (SPSS) software.

4.2. Response Rate

The response rate to questionnaires submitted to the chosen sample is shown in the table 1 below.

Distributed	55	100%
Returned	53	96.4%
Non-returned or invalid	2	3.6%

Table 1; Response Rate, Source; Primary Data

The table 1 above shows that from 55 distributed questionnaires to the population under study, Mashonaland Central Provinces' small grains supply chain key stakeholders, 53 were successfully completed and retained with no significant errors. Therefore, it shows that the response rate was good at 96.4% as shown by the table 1. This response rate is generally acceptable according to Baruch, (2021), which suggest a response rate of 60% or higher is generally acceptable for ensuring reliable results. Therefore this response rate is more than the response prescribed threshold which means the response rate is acceptable to produce reliable data.

4.3. Demographic information

4.3.1. Gender analysis

The results in figure 4 below, shows that the majority of participants were male comprising 64.2% of the total participants, while female participants accounted for 35.8%. This implies that male stakeholders were more actively involved or more dominated the small grains supply chain in Mashonaland Central Province. The gender distribution may reflect existing gender roles in traditional agriculture setups where men are often more represented in farming, processing and distribution roles, while women may be more engaged in household-level processing or consumption.

Figure 4 Gender analysis: Source primary data (2025) *IBM SPSS v27*

4.3.2. Age group analysis

The age distribution of key stakeholders as shown by the bar chart below (Figure 5), the majority (32.1%) were aged between 39 and 48 years, followed by 28.3% in the 29–38 age group and 22.6% aged above 48. Only 17% of the respondents were in the 18–28 age category. This pattern suggests that participation in the small grains supply chain is dominated by the middle-aged and older stakeholders who are often more established in agricultural production due to their access resources, and farming experience (FAO, 2021). This age difference may poses a challenge to the long-term sustainability of the small grains supply chain sector as older stakeholders may retire without sufficient youth involvement to take over production roles.

Figure 5 age group analysis: Source primary data, (2025) *IBM SPSS v27*

4.3.3. Main roles analysis

As shown in Figure 6 below, the larger number of respondents (58.5%) identified their main role in the small grains supply chain as farmers, followed by 28.3% who were processors, and the smallest 13.2% who were traders or distributors. The relatively lower proportion of processors and traders shows that downstream activities such as value addition and marketing remain underdeveloped. This aligns with observations made by Chikazhe and Mudzingwa (2021) who

established that, inadequate marketing networks and processing infrastructure continue to hinder the full development of small grains value chains in Zimbabwe.

Figure 6 main role in small grains supply chain analysis: Source primary data, (2025). IBM SPSS v27

4.3.4. District distribution analysis

Figure 7 below, shows the distribution of small grains stakeholders across the eight districts in Mashonaland Central Province. As presented by the figure, the largest proportion of respondents came from Mbire District (26.4%), followed by Rushinga (20.8%), Guruve and Muzarabani (11.3% each), Mazowe and Bindura (9.4% each), and the smallest shares were from Mt Darwin and Shamva (5.7% each). This distribution shows the widespread participation in small grains production across semi-arid districts such as Mbire and Rushinga, which are known for promoting drought-tolerant crops due to their erratic rainfall patterns (FAO, 2022; Moya et al., 2024).

Figure 7 stakeholder district distribution. Source, Primary data, (2025) IBM SPSS v27

4.4. Perceptions on Small Grains Supply Chain Challenges

4.4.1. Road network analysis

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly agree	2	3.8	3.8	3.8
	Agree	7	13.2	13.2	17.0
	Neutral	14	26.4	26.4	43.4
	Disagree	23	43.4	43.4	86.8
	strongly disagree	7	13.2	13.2	100.0
	Total	53	100.0	100.0	

Table 2 road network analysis Source primary data, (2025) IBM SPSS v27

Figure 8 road network analysis; Source primary data, (2025) *IBM SPSS v27*

As shown in above Table 2 and Figure 8, the majority of key stakeholders expressed dissatisfaction with the conditions of road infrastructure in their areas. Specifically, 43.4% disagreed and 13.2% strongly disagreed with the statement that, 'Road networks in my area support the timely delivery of small grains'. Then Only 13.2% agreed, and just 3.8% strongly agreed, indicating that positive judgment were minimal. The calculated mean score was 3.49 (on a scale of 1 to 5), with a standard deviation of 1.012, highlighting that most responses concentrated around the upper end of the agreement scale showing dissatisfaction. This shows a generally negative perception regarding road accessibility and to support efficient delivery of small grains within the Provinces' supply chain. Poor road infrastructure is a key factor affecting rural supply chains with the significant impact on both production and timely market delivery. These findings highlight the need for targeted investment in rural transport systems to improve mobility and reduce delays and lead times in small grain distribution across districts in Mashonaland Central Province.

4.4.2. Storage infrastructure analysis

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly agree	7	13.2	13.2	13.2
	Agree	7	13.2	13.2	26.4
	Neutral	12	22.6	22.6	49.1
	Disagree	14	26.4	26.4	75.5
	strongly disagree	13	24.5	24.5	100.0
	Total	53	100.0	100.0	

Table 3 Storage infrastructure analysis; Source primary data, (2025) IBM SPSS v27

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
There is adequate storage infrastructure (e.g., silos, warehouses) for small grains in my area.	53	1	5	3.36	1.346	1.811
Valid N (listwise)	53					

Table 4 Descriptive Statistics; Source primary data, (2025) IBM SPSS v27

As shown in Table 3 and 4 above, stakeholders provided varied responses regarding the adequacy of storage infrastructure for small grains from their respective areas. The majority of participants either disagreed (26.4%) or strongly disagreed (24.5%) with the statement, amounting to 50.9%

expressing negative perceptions. About 22.6% remained neutral, while 26.5% either agreed or strongly agreed, indicating that, there is limited infrastructure for small grains storage in the Province. The calculated mean score of the respondents was 3.36 (on a scale of 1 to 5), with a standard deviation of 1.346, indicating a central tendency toward disagreement and a relatively wide variation in responses. This suggests that however there was a notable proportion of respondents acknowledged the presence of storage facilities, a larger group either reported a lack of such infrastructure or questioned their adequacy. As noted by FAO (2022), Effective post-harvest management including access to silos and grain warehouses is an important factor in reducing post-harvest losses therefore, improving food security outcomes, particularly in rural and semi-arid zones. The observed dissatisfaction may reflect long standing challenges small grains investment.

4.4.3. Access to reliable markets analysis

Table 5 and Table 6 below, present that the market access remains a challenge for most stakeholder's participants combined 52.8% of participants either disagreed (35.8%) or strongly disagreed (17.0%) with the statement that; 'There are consistent and accessible buyers or sellers for small grains in my area'. 26.4% agreed or strongly agreed, while 20.8% remained neutral. The mean score was 3.34, with a standard deviation of 1.224, suggesting that responses were skewed toward disagreement and moderately spread across the scale. These results highlight that although a small portion of stakeholders perceive some level of market accessibility, the majority of the respondents have limitations in reaching dependable trading platforms. Limited market access is a common factor affecting smallholder agricultural systems, particularly in rural and semi-arid regions where institutional and infrastructural barriers hinders stakeholders ability to participate competitively in agro-supply chains, (Changalima & Ismail, 2022)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly agree	5	9.4	9.4	9.4
	Agree	9	17.0	17.0	26.4

	Neutral	11	20.8	20.8	47.2
	Disagree	19	35.8	35.8	83.0
	strongly disagree	9	17.0	17.0	100.0
	Total	53	100.0	100.0	

Table 5 reliable and consistence market analysis Source primary data, (2025) IBM SPSS v27

	N	Minimum	Maximum	Mean	Std. Deviation
There are consistent and accessible buyers or sellers for small grains in my area	53	1	5	3.34	1.224
Valid N (listwise)	53				

Table 6 Descriptive Statistics; Source primary data, (2025) IBM SPSS v27

4.4.4. Local market pricing analysis

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly agree	1	1.9	1.9	1.9
	Agree	7	13.2	13.2	15.1
	Neutral	3	5.7	5.7	20.8
	Disagree	25	47.2	47.2	67.9
	strongly disagree	17	32.1	32.1	100.0
	Total	53	100.0	100.0	

Table 7 local market pricing analysis; Source primary data, (2025) IBM SPSS v27

	N	Minimum	Maximum	Mean	Std. Deviation

The pricing of small grains in the local market is fair and consistent	53	1	5	3.94	1.045
Valid N (listwise)	53				

Table 8 Descriptive Statistics; Source primary data, (2025) IBM SPSS v27

As presentded by Table 7 and Table 8 above, stakeholders' perceptions on pricing fairness for small grains in their local market reveal widespread dissatisfaction of 47.2% disagreed and 32.1% strongly disagreed, showing that over 81% of respondents viewed small grain pricing as unfair or inconsistent in Mashonaland Central Province. Only 13.2% agreed, while a minimal 5.7% remained neutral. The computed mean score was 3.94, and a standard deviation of 1.045, suggesting a clear trend toward disagreement and relatively low variation in responses. This pattern reflects persistent issues of price volatility and weak buyer transparency in informal small grain markets, Such instability in pricing discourages sustained production and can reduce small grain commercialisation efforts within the province.

4.4.5. Government Support analysis

The data collected regarding government support for small grains production and distribution reveals significant insights into key stakeholders perceptions.

The table 9 and 10 below, shows that out of 53 respondents:

- Strongly Disagree 7 (13.2%)
- Disagree 17 (32.1%)
- Neutral 18 (34.0%)
- Agree 9 (17.0%)
- Strongly Agree 2 (3.8%)

From this distribution, it is evident that a substantial number of stakeholders respondents (45.3%) expressed disagreement or strong disagreement on the adequacy of government support for small

grains production. However, only 20.8% of respondents expresed agreement or strong agreement, indicating a general perception of inadequacy in governmental assistance to small grains supply chain in the Province.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	7	13.2	13.2	13.2
	Disagree	17	32.1	32.1	45.3
	Neutral	18	34.0	34.0	79.2
	Agree	9	17.0	17.0	96.2
	strongly agree	2	3.8	3.8	100.0
	Total	53	100.0	100.0	

Table 9 government support analysis; Source primary data, (2025) IBM SPSS v27

	N	Minimum	Maximum	Mean	Std. Deviation
The government provides adequate support for small grains production and distribution.	53	1	5	3.34	1.037
Valid N (listwise)	53				

Table 10 Descriptive statistics; Source primary data, (2025) IBM SPSS v27

From the Table 10 above the Mean is 3.34 and Standard Deviation is 1.037. indicates that, respondents on average lean towards disagreement concerning the adequacy of government support, variability in perceptions, with some stakeholders feeling more strongly than others about the level of support received.

4.4.6. NGOs Support analysis

The results regarding the effectiveness of NGOs in improving access to markets, inputs, or knowledge on small grains were analyzed using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), following interpretation summarizes the findings as shown by the table 11 and table 12 below

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly agree	2	3.8	3.8	3.8
	Agree	7	13.2	13.2	17.0
	Neutral	11	20.8	20.8	37.7
	Disagree	22	41.5	41.5	79.2
	strongly disagree	11	20.8	20.8	100.0
	Total	53	100.0	100.0	

Table 11 NGO support analysis; Source primary data, (2025) IBM SPSS v27

	N	Minimum	Maximum	Mean	Std. Deviation
The government provides adequate support for small grains production and distribution.	53	1	5	3.34	1.037
Valid N (listwise)	53				

Table 12Descriptive Statistics NGO support analysis; Source primary data, (2025) IBM SPSS v27

The above table 11 and table 12 presented the following results;

- Strongly Disagree 11 (20.8%)
- Disagree 22 (41.5%)
- Neutral 11 (20.8%)

- Agree 7 (13.2%)
- Strongly Agree 2 (3.8%)
- Mean of 3.34
- Standard Deviation of 1.037

The results indicating a majority of respondents (62.3%) either disagreed or strongly disagreed with the statement that NGOs have improved access to markets, inputs, or knowledge related to small grains. In however only 17.0% of stakeholder participants expressed agreement or strong agreement with the effectiveness of NGO interventions. With a mean score of 3.34, the data shows that participants generally lean towards disagreement regarding the impact of NGOs on market access for small grains. The standard deviation of 1.037 indicates a moderate level of variability in responses, reflecting difference in opinions among the respondents.

4.4.7. Community based cooparatives anaysis

Respondents were asked to indicate their level of agreement with the statement: "There are functional community cooperatives supporting small grain marketing and input access in my area." This question was designed to assess stakeholder perceptions regarding institutional support specifically from cooperatives as part of the moderating variable in the conceptual framework (Government and NGO Support).

Table 4.13 community based coperative analysis

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly agree	2	3.8	3.8	3.8
	Agree	6	11.3	11.3	15.1
	Neutral	6	11.3	11.3	26.4
	disagree	23	43.4	43.4	69.8
	strongly disagree	16	30.2	30.2	100.0
	Total	53	100.0	100.0	

Table 13 Community based cooperatives analysis; Source primary data, (2025) IBM SPSS v27

Figure 9 community based cooperatives analysis Source primary data, (2025) *IBM SPSS v27*

The table 13 and histogram (figure 9) above shows the majority of respondents disagreed with the statement, with 43.4% indicating “Disagree” and 30.2% selecting “Strongly Disagree”. Together 73.6% of respondents expressed negative perceptions about the functionality of community-based cooperatives in their areas. Only 15.1% of the respondents agreed (either “Agree” or “Strongly Agree”) that such cooperatives are active and supportive in small grain marketing and input distribution. This pattern suggests that community level cooperative support structures which could play a critical role in aggregating smallholder output, negotiating better prices, and facilitating input access are either absent, inactive, or ineffective in much of the study area. The remaining 11.3% of respondents chose “Neutral,” which may indicate limited awareness or mixed experiences with such initiatives.

4.4.8. Discussion of Results; Perceptions on Small Grains Supply Chain Challenges

The findings of this study indicate that infrastructure availability particularly road networks and storage facilities remains a significant factor affecting the small grains supply chain within Mashonaland Central Province as shown by earlier analysis. In semi-arid regions where small grains producers are located far away from markets, poor road networks have been widely recognized as a structural barrier to effective agricultural supply chains, (FAO, 2022). The limited access to adequate storage infrastructure in the study area likely contributes to increased post-harvest losses and limits the ability of farmers to store and sell grains when prices are favorable, therefore affecting the small grains availability in the country.

These findings align with previous studies such as Chikazhe and Mudzingwa (2021), who pointed out that, inadequate transport and storage infrastructure are one of the leading factors affecting the commercialization of small grains in Zimbabwe. As shown by the findings, the uneven distribution of infrastructure between districts may further marginalize producers in remote areas, such as Rushinga or Mbire districts where both road and storage facilities are less developed. The results highlight the need for policy interventions and investment in rural infrastructure, particularly targeting road rehabilitation and the construction of community-level grain storage facilities. Strengthening these systems could reduce losses and enable producers to respond better to market demands, therefore improved livelihoods.

The findings of this study suggested that access-related factors particularly unreliable markets and inconsistent pricing are significant barriers to the small grains supply chain in Mashonaland Central Province. These fndings suggest that a significant number of small grains stakeholders operate in environments with limited or unstable market links, which often reduces farmers' incentives to produce surpluses for sale and reduces their ability to negotiate favorable terms for their produce (Changalima & Ismail, 2022). Inconsistent pricing often results from buyer dominance, poor market regulation, and the lack of transparent market information systems, these

factors disproportionately affect smallholder farmers operating in informal or underdeveloped market settings (Tavuyanago et al., 2022).

The effect of unreliable markets and unfair pricing creates a cycle of disincentives for small grain producers, reducing supply chain participation and potentially affecting food security and rural livelihoods for small grains supply chain stakeholders. These findings are inline with existing literature, which has documented how market imperfections and pricing volatility are significant structural factors in Zimbabwe's smallholder agricultural economy (Chikazhe & Mudzingwa, 2021).

The low mean score indicating a pressing need for the government to reassess its support mechanisms to foster a more favorable environment for small grains production. As presented by Chikazhe et al. (2021), effective government support is crucial for enhancing agricultural productivity and ensuring food security in developing regions. The findings noted the necessity for improved government participation in supporting small grains production and distribution in Mashonaland Central Province. Addressing the issues raised by respondents can lead to enhanced agricultural outcomes and contribute positively to the livelihoods of small grains supply chain stakeholders in the region.

Makhura et al. (2020) noted that, the role of NGOs is critical in ensuring that farmers gain access to necessary resources and knowledge to enhance productivity. However, the results shows a significant perception inadequacy concerning NGO support in facilitating market access for small grains in Mashonaland Central Province. The low mean score and high percentage of disagreement indicated that there is need for NGOs to reevaluate their strategies to enhance their engagement with farmers and all key stakeholders to provide effective support. The data reviewd a concern regarding the perceived effectiveness of NGOs in improving access to markets, inputs, and sknowledge for small grains in Mashonaland Central Province to improve food security and livelihoods.

A significant gap in the institutional support needed to strengthen small grain value chains was highlighted by the stakeholder participants' responses. Since the conceptual framework posits that government and NGO support influences outcomes such as improved livelihoods and increased grain availability, the apparent absence or dysfunction of cooperatives could be a limiting factor. This reinforces the need for stronger policy interventions, targeted capacity-building, and revitalization of local farmer organizations to serve as reliable support mechanisms in the small grains supply chain.

4.5. Strategy Prioritization

This section presents stakeholder responses to various proposed strategies aimed at improving the small grains supply chain in Mashonaland Central Province. To address the second objective of the study to propose strategies that can be implemented to promote the availability of small grains in agro-supply chains respondents were asked to rate the importance of several suggested interventions using a 5-point Likert scale, where 1 = Strongly Disagree and 5 = Strongly Agree.

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4.5.1 Upgrade Rural Road Infrastructure and Storage Facilities

A total of 22 respondents (41.5%) strongly agreed and 17 (32.1%) agreed that improving rural roads and storage infrastructure would help reduce post-harvest losses as shown by table 14 below. Only 6 respondents disagreed (11.3%), while 8 (15.1%) remained neutral. The table 15 shows that the strategy received a mean score of 4.02 with a standard deviation of 1.07, indicating strong agreement with low variability. A combined 73.6% agreement shows clear consensus that inadequate road infrastructure and storage facilities are major bottlenecks in the supply chain. Respondents view infrastructural improvement as a top priority that can directly impact transportation efficiency and post-harvest handling. Investments in rural infrastructure can reduce delays, limit crop losses, and enable farmers to reach markets more reliably, contributing to the overall efficiency of the supply chain (FAO, 2022).

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	1	1.9	1.9	1.9
	Disagree	5	9.4	9.4	11.3
	Neutral	8	15.1	15.1	26.4
	Agree	17	32.1	32.1	58.5
	strongly agree	22	41.5	41.5	100.0
	Total	53	100.0	100.0	

Table 14 Infrastructure upgrade analysis; Source primary data, (2025) IBM SPSS v27

	N	Minimum	Maximum	Mean	Std. Deviation
Upgrade rural road infrastructure and storage facilities to reduce post-harvest losses.	53	1	5	4.02	1.065
Valid N (listwise)	53				

Table 15 Descriptive statistics; Source primary data, (2025) IBM SPSS v27

5.2 Strengthen Local Market Access through the Formation of Cooperatives

Tables below (16 and 17) shows that, among the respondents, 16 (30.2%) strongly agreed and 18 (34.0%) agreed that cooperative based market access could improve the supply chain. A total of 10 respondents (18.9%) were neutral, while 9 (17.0%) disagreed or strongly disagreed. The mean score was 3.72 with a standard deviation of 1.18. This strategy received the second highest level of agreement, with over 64% of respondents supporting it. Participants see cooperatives as a

potential solution to challenges in market access, including unreliable buyers and poor price negotiation.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	3	5.7	5.7	5.7
	Disagree	6	11.3	11.3	17.0
	Neutral	10	18.9	18.9	35.8
	Agree	18	34.0	34.0	69.8
	strongly agree	16	30.2	30.2	100.0
	Total	53	100.0	100.0	

Table 16 Strengthening local market access analysis; Source primary data, (2025) IBM SPSS v27

	N	Minimum	Maximum	Mean	Std. Deviation
Strengthen local market access through the formation of farmer cooperatives.	53	1	5	3.72	1.183
Valid N (listwise)	53				

Table 17: Descriptive Statistics analysis; Source primary data, (2025) IBM SPSS v27

4.5.3 Implement Price Incentives for Climate-Resilient Small Grains

From data collected from the participants, only 6 respondents (11.3%) strongly agreed and another 6 (11.3%) agreed with this strategy. Meanwhile, 17 respondents (32.1%) strongly disagreed and

12 (22.6%) disagreed, with another 12 (22.6%) being neutral as presented by the table 18 below. The strategy had a mean score of 2.47 and a standard deviation of 1.35. This strategy showed divided views, with more than half of respondents either disagreeing or remaining neutral. The low mean and high standard deviation suggest that price incentives are not currently seen as a reliable or effective intervention. Although price incentives may work in more structured markets, their limited perceived value here may reflect uncertainty in government implementation or weak market structures (Zhou et al., 2022).

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	17	32.1	32.1	32.1
	Disagree	12	22.6	22.6	54.7
	Neutral	12	22.6	22.6	77.4
	Agree	6	11.3	11.3	88.7
	strongly agree	6	11.3	11.3	100.0
	Total	53	100.0	100.0	

Table 18 Price incentives analysis; Source primary data, (2025) IBM SPSS v27

	N	Minimum	Maximum	Mean	Std. Deviation
Implement price incentives to encourage the production of climate-resilient small grains.	53	1	5	2.47	1.353
Valid N (listwise)	53				

Table 19 Descriptive analysis; Source primary data, (2025) IBM SPSS v27

4.5.4. Expand Government and NGO Training Programs

A total of 5 respondents (9.4%) strongly agreed and 6 (11.3%) agreed with expanding training programs. In contrast, 16 respondents (30.2%) strongly disagreed and 14 (26.4%) disagreed, while 12 (22.6%) were neutral, the mean score was 2.43 with a standard deviation of 1.29, as shown by table 20 and 21 below. This strategy ranked fourth in support, with nearly 57% of respondents expressing disagreement. This may reflect a perception that training without physical or financial support has little impact on production or marketing.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	16	30.2	30.2	30.2
	disagree	14	26.4	26.4	56.6
	Neutral	12	22.6	22.6	79.2
	Agree	6	11.3	11.3	90.6
	strongly agree	5	9.4	9.4	100.0
	Total	53	100.0	100.0	

Table 20 Government and NGO training programs analysis; Source primary data, (2025) IBM SPSS v27

	N	Minimum	Maximum	Mean	Std. Deviation
Expand government and NGO training programs on climate-resilient farming practices.	53	1	5	2.43	1.294

Valid N (listwise)	53				

Table 21 Descriptive Statistics; Source primary data, (2025) IBM SPSS v27

4.5.5 Other Alternative Interventions

This option had the least support as shown by the table 22 and histogram (figure 10) below: 4 respondents (7.5%) strongly agreed and 7 (13.2%) agreed, while 31 (58.5%) disagreed or strongly disagreed. Eleven (20.8%) were neutral. The strategy had a mean score of 2.40 and a standard deviation of 1.26. The majority of respondents did not propose or support alternative interventions beyond the main strategies. This implies that stakeholders considered the listed strategies comprehensive or were unsure about additional options.

Further stakeholder engagement may be required to explore locally relevant innovations or overlooked challenges. However, the focus should remain on the high-priority areas already identified.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	16	30.2	30.2	30.2
	Disagree	15	28.3	28.3	58.5
	Neutral	11	20.8	20.8	79.2
	Agree	7	13.2	13.2	92.5
	strongly agree	4	7.5	7.5	100.0
	Total	53	100.0	100.0	

Table 22 Other alternative interventions analysis; Source primary data, (2025) IBM SPSS v27

Figure 10 Histogram other interventions analysis Source primary data, (2025) *IBM SPSS v27*

4.5.1. Discussion of the results; proposed strategies

The results show that respondents placed the highest importance on upgrading rural infrastructure and storage facilities, which received a mean rating of 4.02, indicating strong agreement across the sample. The second most favored strategy was strengthening market access through cooperatives (Mean = 3.72), which aligns with earlier findings that institutional support structures are limited but viewed as essential for improving the distribution and commercialization of small grains. Implementing price incentives (Mean = 2.47) and expanding training programs (Mean = 2.43) were rated lower in importance. Other strategies category also had a low average (2.40), implying that most respondents did not emphasize additional unlisted interventions.

These findings imply that any interventions aimed at strengthening the small grains supply chain in Mashonaland Central Province should prioritize physical infrastructure development and cooperative based market access models. While capacity building and pricing systems are important, they are likely to be more effective after foundational logistics and marketing structures are addressed. Policymakers and development organizations should thus focus their immediate efforts on repairing road networks, expanding storage facilities, and supporting the formalization of local farmer cooperatives.

4.6. Chapter summary

This chapter included the analysis of data collected using questionnaire from selected respondents. The data was resented, using frequency tables, descriptive statistics, pie chats bar graphs and histograms. The following chapter will provide the conclusions of the study.

CHAPTER V: CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the major findings, draws conclusions from the results discussed in Chapter Four, and provides policy and practical recommendations based on the research objectives. The chapter also shows the extent to which the study had archived its objectives.

5.2 Summary of the major findings

The purpose of this study was to examine the factors affecting the small grains supply chain in Mashonaland Central Province, Zimbabwe. The study was guided by two main objectives:

i. To identify the challenges encountered by key stakeholders in the small grains supply chain.
ii. To propose strategies that can be implemented to improve the availability and efficiency of small grains in agro-supply chains.

The chapter also reflects on the study's theoretical foundations, namely the Agricultural Household Model (AHM) and Supply Chain Management (SCM) theory, and suggests areas for further research. A quantitative descriptive survey design was used, and data were collected through structured, closed-ended questionnaires administered to 53 participants across multiple districts across Mashonaland Central Province. The variables measured included infrastructure availability, market access, government and NGO support, cooperative functionality, and the perceived impact of various proposed interventions.

5.3 Summary of the Findings

The study determines that the small grains supply chain in Mashonaland Central Province is affected by both structural (infrastructure) and institutional (support systems and market linkages) factors. These constraints limit efficiency, reduce production incentives, and hinder the full participation of small grains stakeholders such as smallholder farmers and traders in agro supply chains across the province.

From a theoretical standpoint, the findings align with the Agricultural Household Model, which suggests that household production and market decisions are shaped by risk, access to resources, and institutional support. The limited access to reliable markets, poor infrastructure, and weak cooperatives increase the transaction costs and risks associated with producing and selling small grains. Similarly, from a Supply Chain Management perspective, the lack of coordination among actors and poor logistical support contributes to inefficiency and post-harvest losses.

This study has provided evidence that improving infrastructure, market linkages, and institutional support can significantly strengthen the small grains supply chain in Mashonaland Central Province. However progress has been made in promoting climate-resilient crops, greater effort is needed to address the practical and systemic constraints that limit their impact at scale. Strengthening collaboration between government agencies, NGOs, and community structures is key to unlocking the full potential of small grains for food security and rural livelihoods in Zimbabwe.

5.4 Conclusion

i. **Objective 1; to identify the challenges encountered by key stakeholders in the small grains supply chain.**

Infrastructure challenges which includes poor road networks and limited storage facilities were identified as major challenges, affecting timely delivery and post-harvest small grain quality within the province. Market access issues such as lack of reliable buyers and sellers, inconsistent pricing, and limited market information, which discouraged many stakeholders from active engagement. Lack of adequate government and NGO support was also noted as challenges that affecting small grains supply chains. Lack of functional community-based cooperatives to provide with market related information and trends in the small grains production, was also suggested as challenge that affects these supply chains in Mashonaland Central Province (Nciizah, 2021).

i. **Objective 2; to propose strategies that can be implemented to improve the availability and efficiency of small grains in agro-supply chains.**

The funding showed that stakeholders prefers structural interventions over knowledge-driven or policy-based solutions to improve the small grains supply chain in the province. Improving rural infrastructure such as storage facilities and road networks emerged as most supported solution, suggesting that post-harvest handling and physical access fundamental weakness in the current small grains supply chain. Similarly the creation of community-based cooperatives was viewed as an impotent factor for enhancing collective and input access. Strategies such as price incentives and training programs received lower ratings, suggesting that, they are not seen as immediate priorities while respondents acknowledge their relevance. The strategies that are prioritized by respondents highlights the need practical reforms on the ground that reduces transactional costs, fostering stakeholder partnerships and improve coordination. From a supply management point of view, this ensures that addressing physical and institutional linkages is critical to improving small grains availability and across all stages from production to marketing (Kurma and Yadav, 2024)

5.5 Recommendations

i. Rehabilitate Rural Infrastructure: The government and its development partners should prioritize the rehabilitation of rural road networks and invest in decentralized storage facilities to reduce transport costs and post-harvest losses.

ii. Revive and Support Cooperatives: Local cooperatives should be revitalized and supported through training, funding, and technical assistance to promote collective marketing and input access.

iii. Expand Government and NGO Support: Increased and better-coordinated support should be provided to farmers, especially in the form of extension services, input subsidies, and value chain training programs.

iv. Introduce Market Stabilization Measures: Policies such as minimum guaranteed pricing, regulated buying points, and transparent price dissemination mechanisms should be introduced to address price volatility.

v. Integrate Youth into the Supply Chain: Targeted programs should be developed to involve youth in small grains production and trade, ensuring long-term sustainability and generational knowledge transfer.

5.6 Areas for Further Research

The profitability and long-term economic viability of small grains versus other staple crops in different agro-ecological zones. The role of digital technologies and mobile platforms in improving smallholder market access and supply chain coordination. A comparative analysis of small grain supply chains across different provinces or countries within the SADC region. Longitudinal studies assessing the impact of cooperative revival on farmer income and market engagement over time.

5.7 chapter Summary

This chapter covered the summary of the study, summary of major findings, summary of the findings, conclusion of the study, recommendations and areas for further research.

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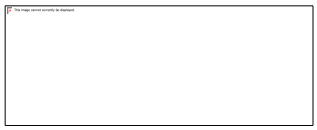
APPENDICES



Appendix 1; QUESTIONNAIRE

Purpose:

To gather in-depth insights from key stakeholders about the effects that are affecting small grains supply chain in Mashonaland central Province.

Dear valid respondent.

My name is Omega P Mudimu. I am perusing a bachelor's degree in Supply Chain Management at Bindura University of Science Education. I am conducting research on the factors that are affecting small grains supply chain in Zimbabwe, a case study of Mashonaland Central Province. I kindly invite you to participate in this study. Your response will provide valuable insights to this study. Please be assured that, this research is sorely for academic purposes and it will not be used for other reasons without the participants or Bindura University of Science Education consent. All data collected will be kept strictly confidential. I appreciate your understanding and willingness to assist me in my research work.

SECTION A: Demographic Information

1. Gender:

   ☐ Male ☐ Female

2. What is your age

   ☐ 18-28 years ☐ 29- 38 years ☐ 39-48 years ☐ over 48 years

3. What is your main role in the small grains supply chain?

☐ Farmer ☐ Trader/ distributor ☐ Processor

vi. District: ……..

SECTION B: **Perceptions on Small Grains Supply Chain Challenges**

Please indicate your level of agreement with the following statements using the scale below:

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

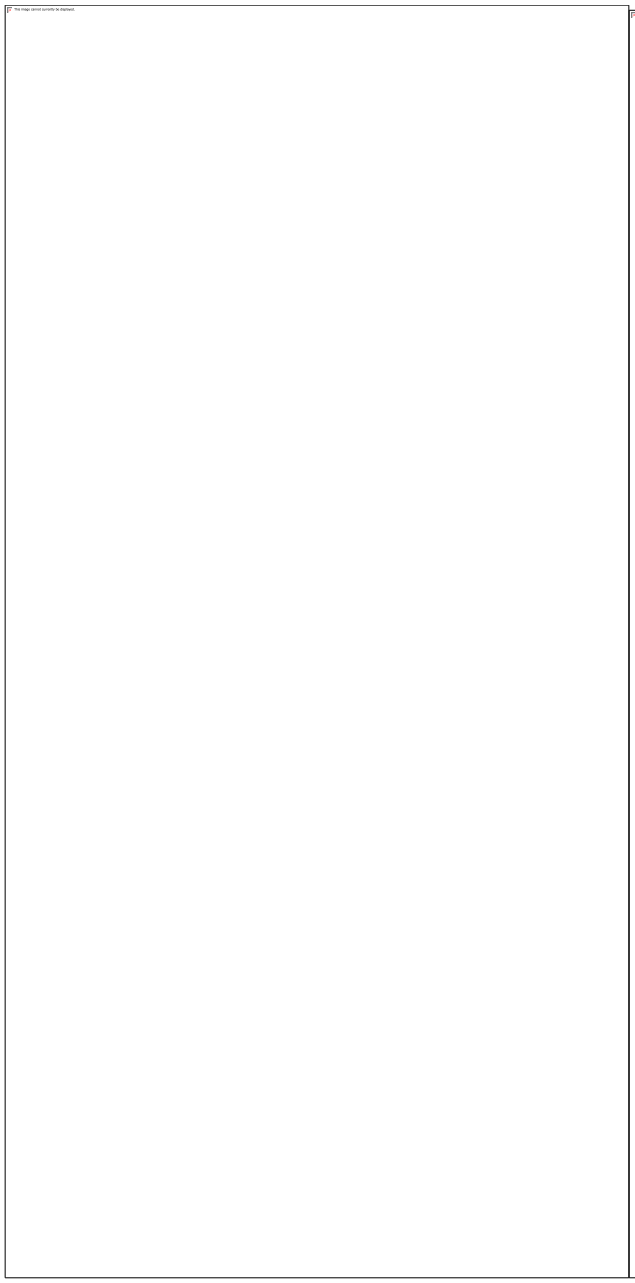
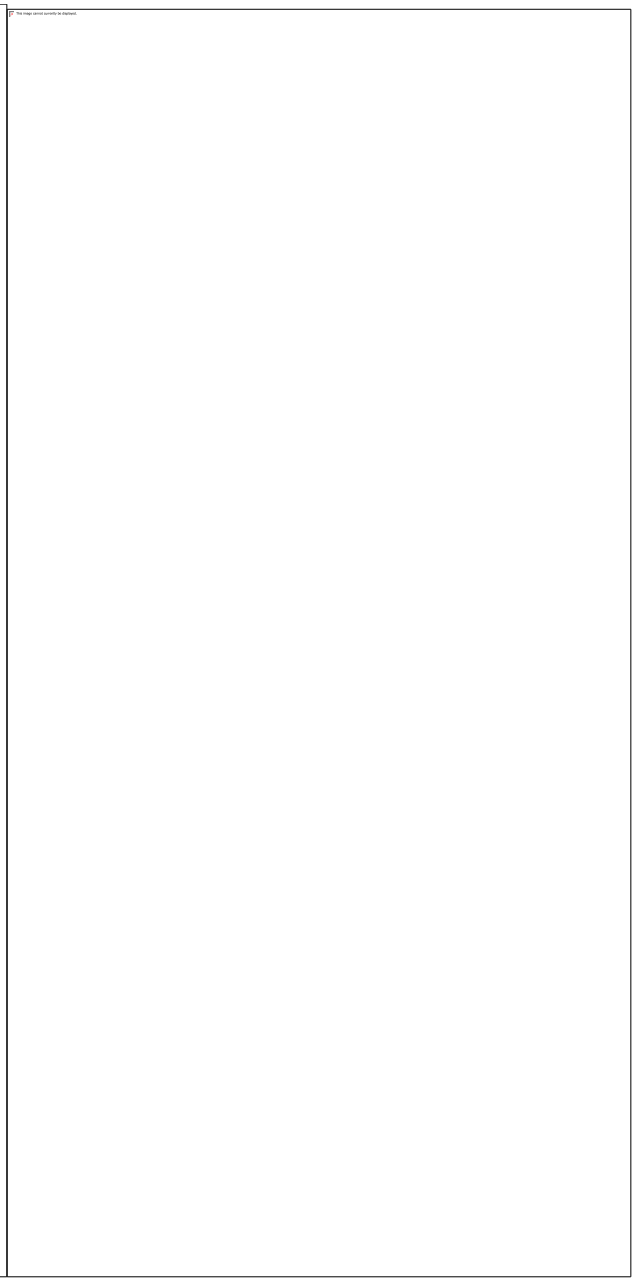
Statement	**1**	**2**	**3**	**4**	**5**
The road network in my area supports timely delivery of small grains					
There is adequate storage infrastructure (e.g., silos, warehouses) for small grains in my area.					
The pricing of small grains in the local market is fair and consistent					
There are consistent and accessible buyers or sellers for small grains in my area					
The government provides adequate support for small grains production and distribution.					
NGOs have increased awareness or training on small grains.					
There are functional community-based cooperatives supporting small grain marketing and input access in my area.					

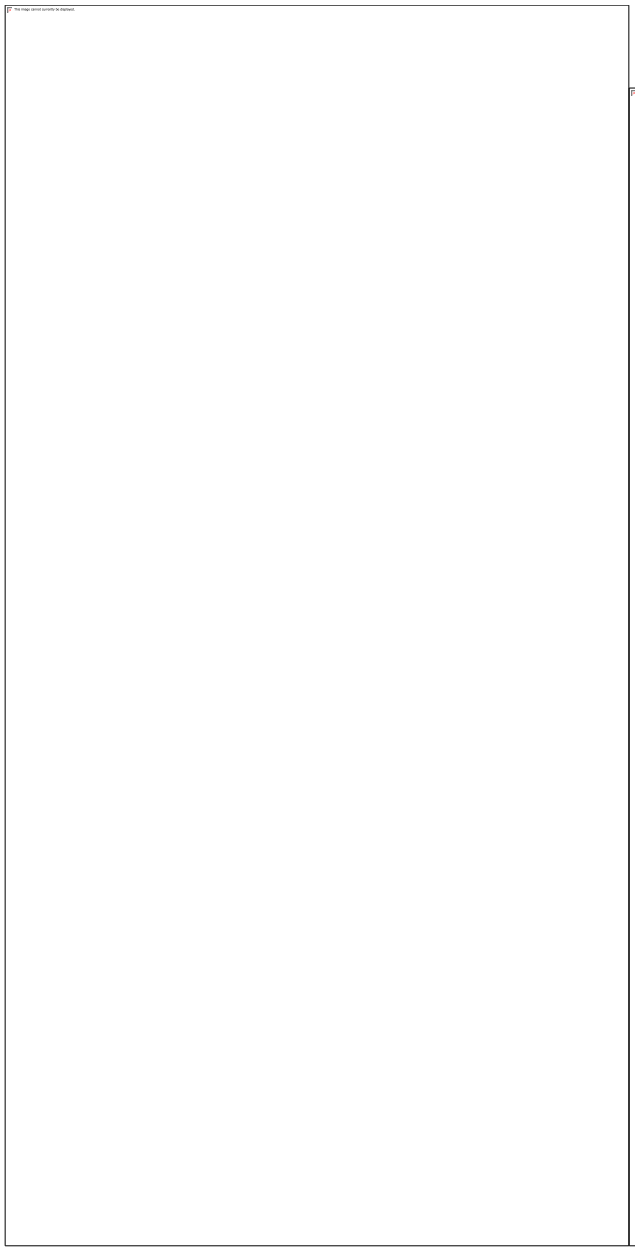
SECTION C; Strategy Prioritization

Please rate the importance of each of the following strategies for improving small grains supply chains in your area

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

Strategy	**1**	**2**	**3**	**4**	**5**
Upgrade rural road infrastructure and storage facilities to reduce post-harvest losses.					
Strengthen local market access through the formation of farmer cooperatives.					
Implement price incentives to encourage the production of climate-resilient small grains.					
Expand government and NGO training programs on climate-resilient farming practices.					
Other…….					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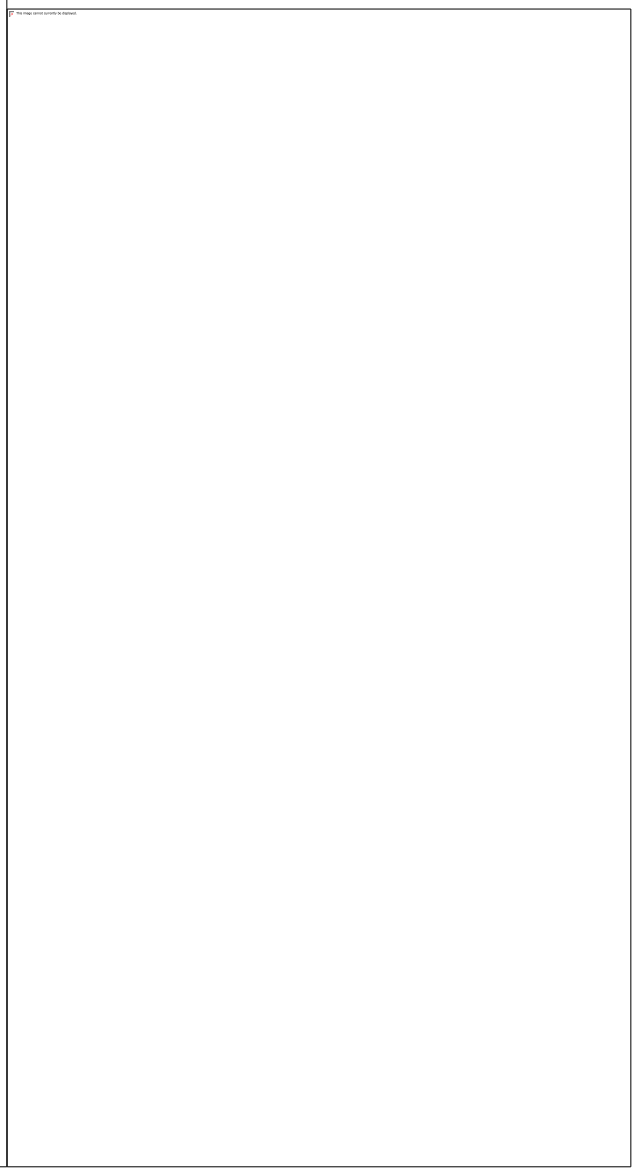
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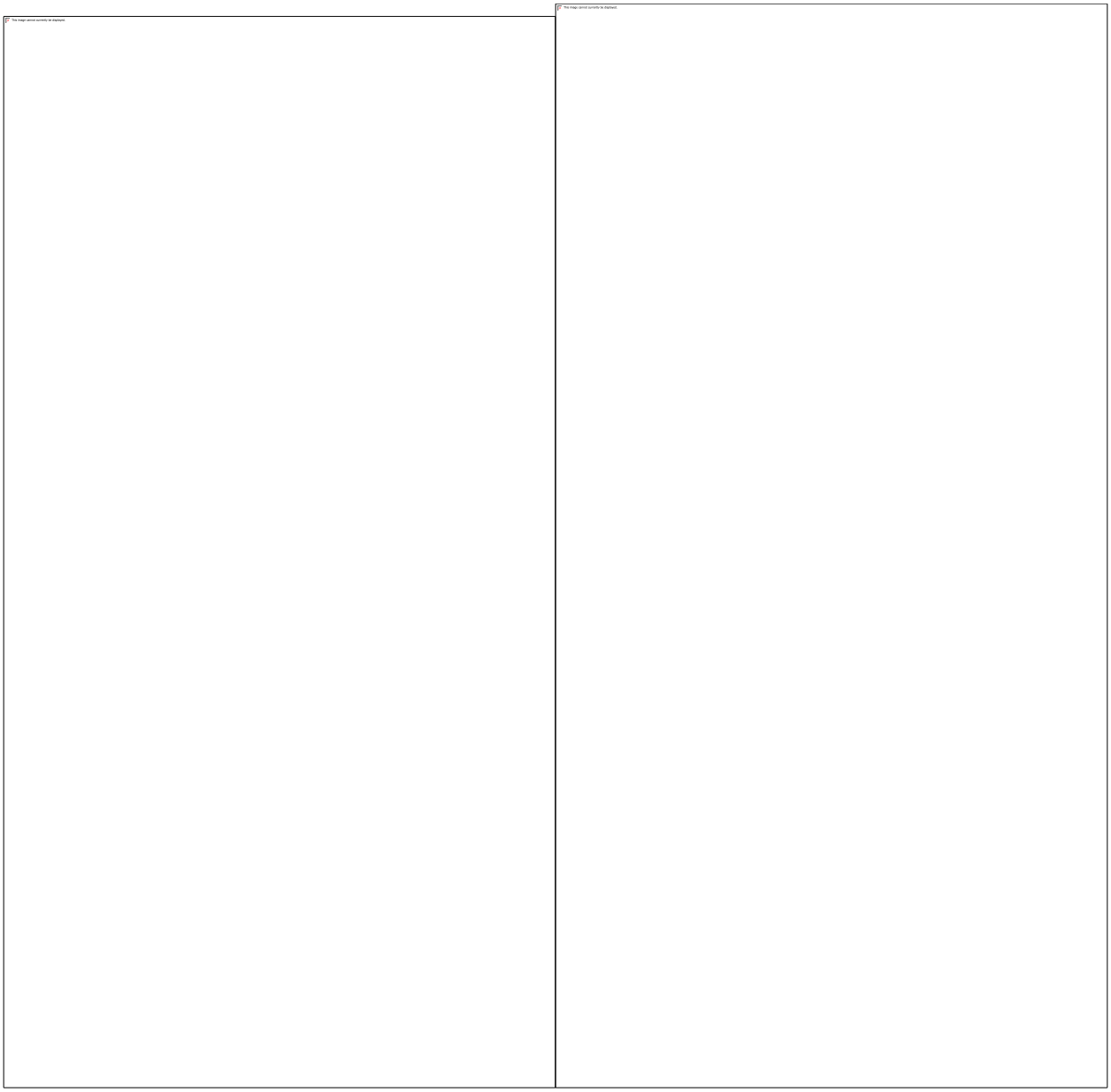

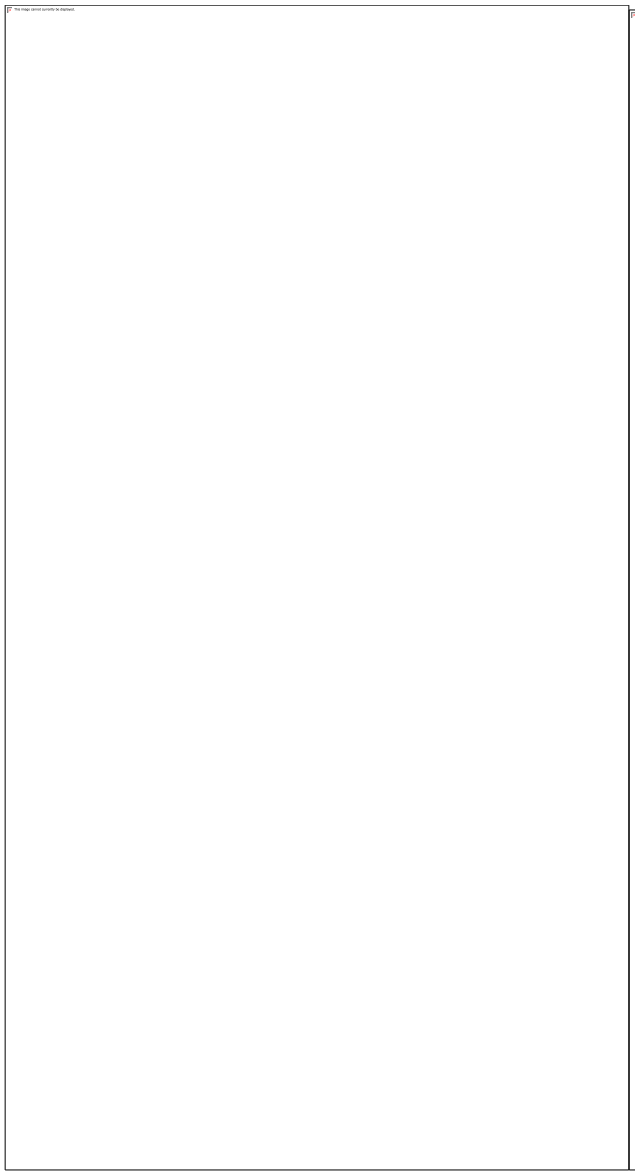
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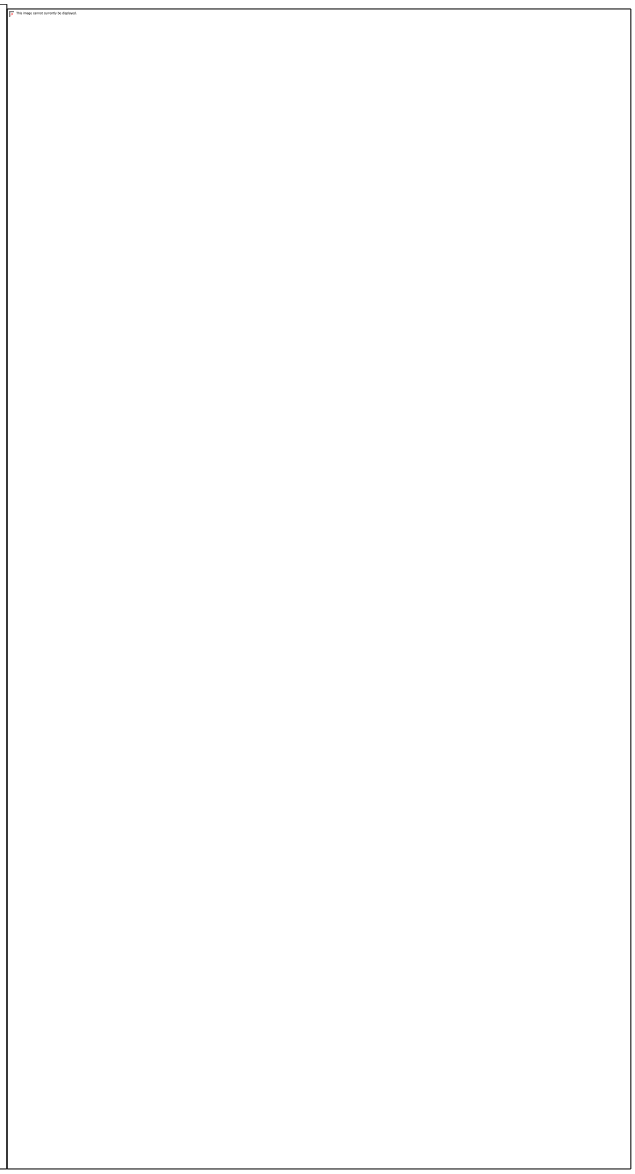
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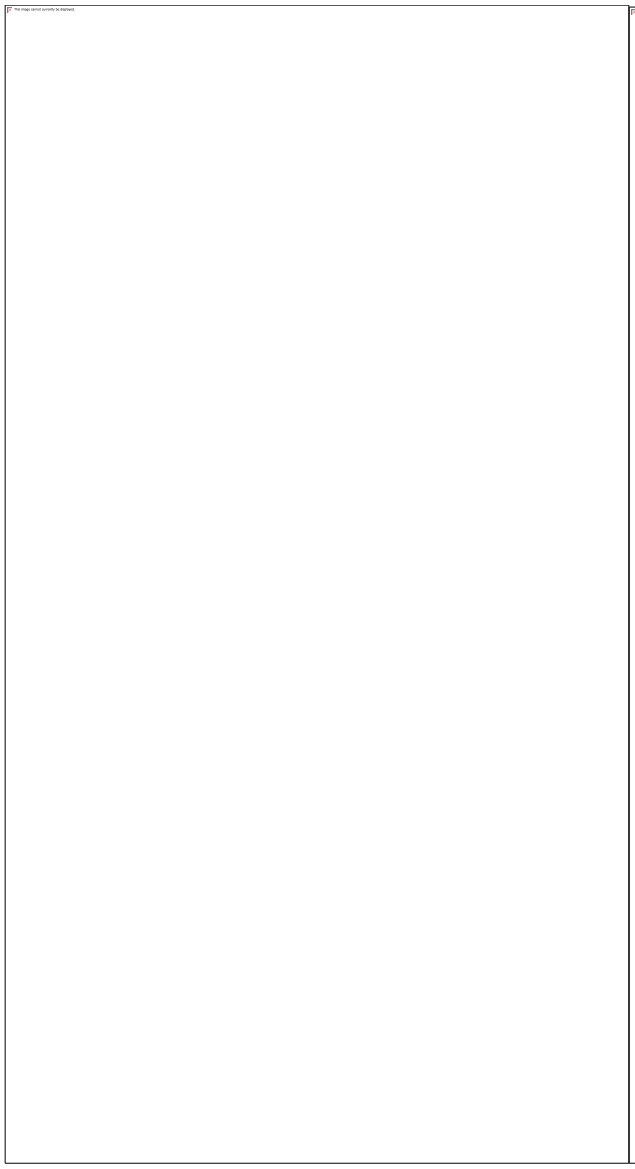
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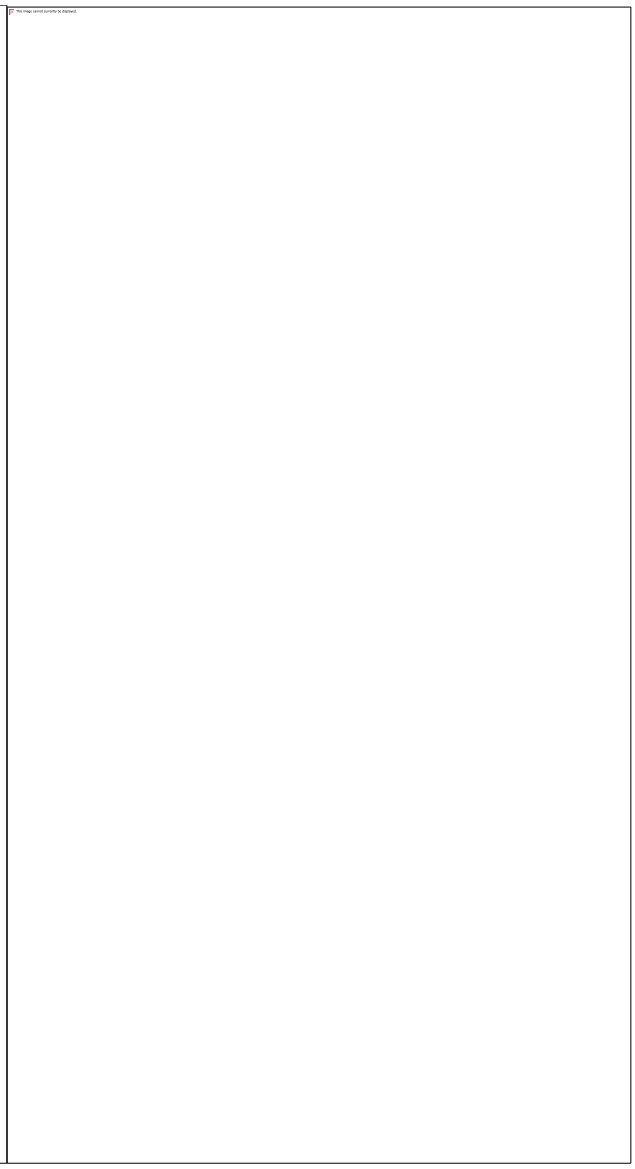
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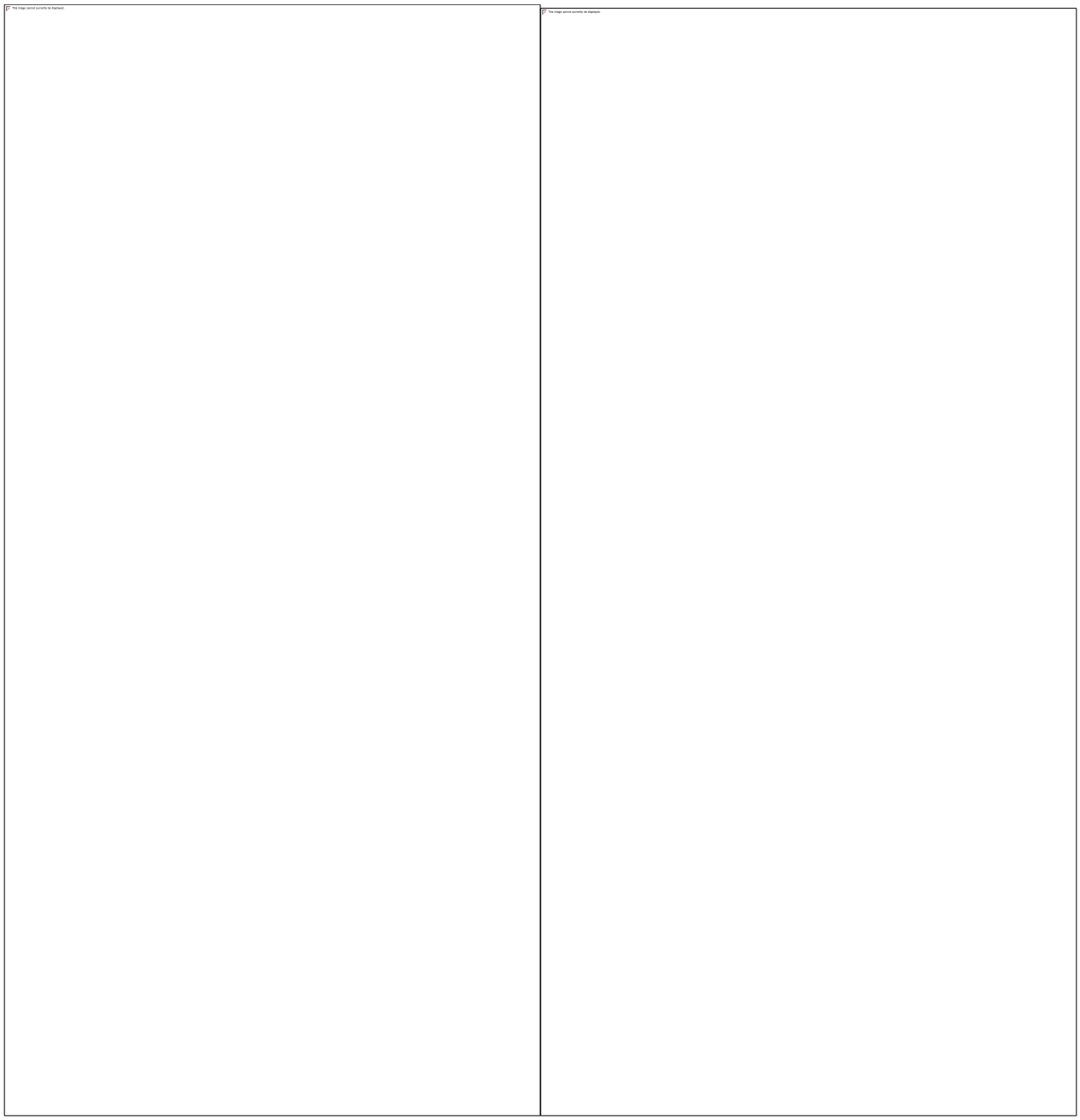

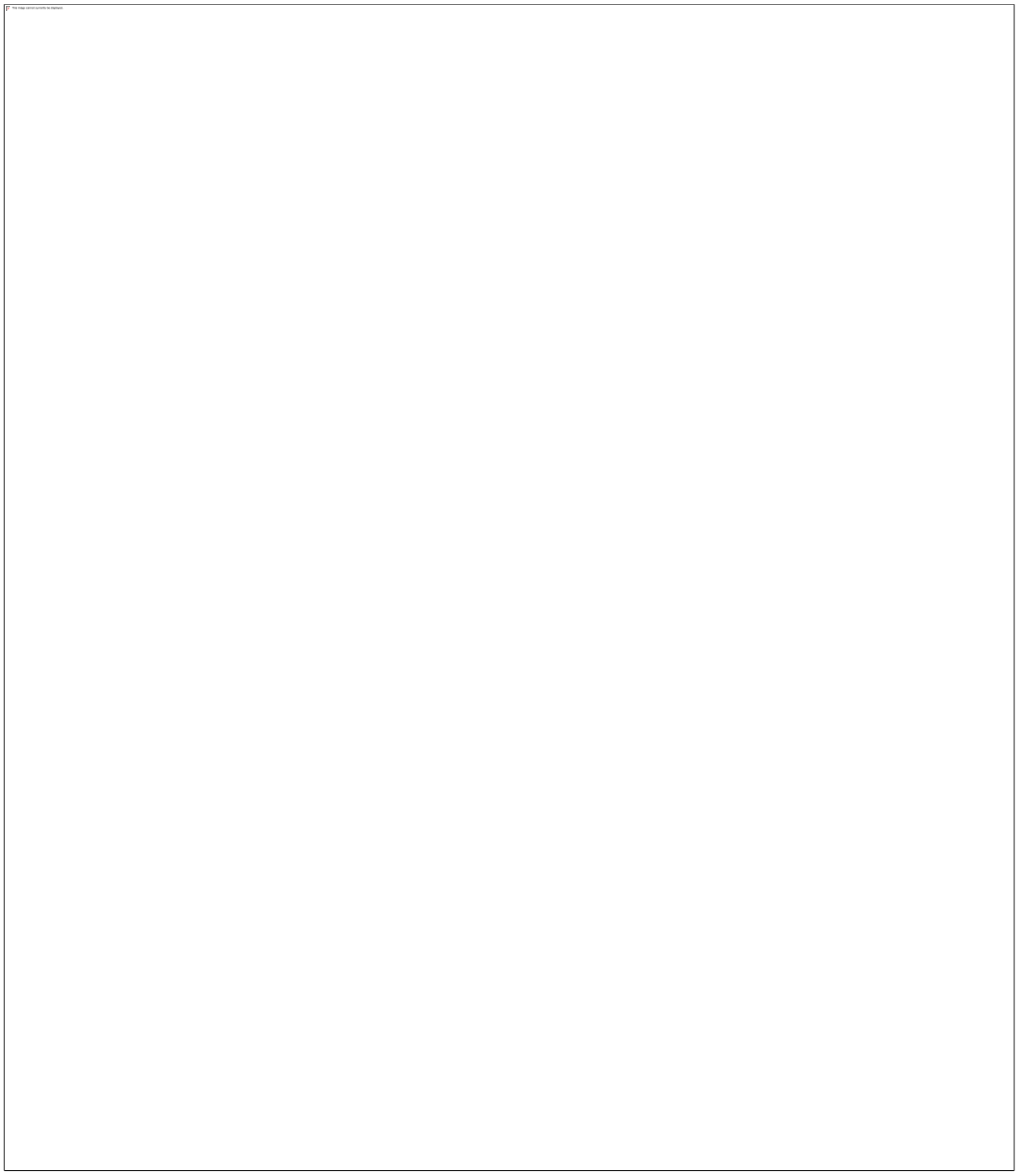
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