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## Article

# Warehouse management practices and business performance of small-scale grapes processing firms: evidence from Tanzania

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# Warehouse management practices and business performance of small-scale grapes processing firms: evidence from Tanzania

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## ABSTRACT

*This paper examines the relationship between warehouse management practices including material handling, storage, inventory, and packaging and the business performance of small-scale grapes processing firms in Dodoma Region, Tanzania. A resource-based view theory guided the study based on the key variables. Data were collected using a survey questionnaire administered to 202 small-scale grapes processing firm owners. The study uses a cross-sectional survey design. Data were then subjected to descriptive and structural equation modelling. The findings indicated a significant positive relationship between the firm's business performance and the management of material handling ( $\beta=0.112$ ,  $p=0.009$ ), storage ( $\beta=0.249$ ,  $p<0.0001$ ), and inventory control ( $\beta=0.043$ ,  $p<0.0001$ ). However, there was no relationship between packaging management ( $\beta=0.379$ ,  $p=0.550$ ) and business performance. The study concluded that warehouse management practices are crucial for unlocking improved business performance in the small-scale grapes processing sector. By examining the link between warehouse management and positive business outcomes, this study offers valuable guidance for managers seeking to optimise their operations. This research contributes to the resource-based view theory by introducing new constructs not previously examined for small Tanzanian grape processors. The study, therefore, recommends the need for paying close attention to warehouse management practices if the grapes firms were to realise remarkable business while contributing significantly to the national economy.*

## ARTICLE HISTORY

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## 1. Introduction

Warehouse Management Practices (WMPs) have become an important node in the logistics operations of many processing firms in both developed and developing countries (De Koster et al., 2017). Kidane (2021) views such practices as crucial conditions for contributing to the enhancement of efficiency and effectiveness in the control of the movement of goods and their storage within a warehouse and, therefore, leading to an improved firm's business performance. The rise in WMPs within firms is credited to the optimisation of space, labour, and equipment usage, along with the reduction of handling and storage costs (Campus, 2013; Kusriani et al., 2018). Oluyemisi et al. (2022) view WMPs as key for adding goods' value, maximising goods' quality, and controlling the firm's inventory levels, meanwhile ensuring the safety of the goods/products within a given warehouse. In spite of these acknowledgements, there is a yet dearth of literature on evidence demonstrating the effect of WMPs on the specific and overall business-related performances of small-scale processing firms (Alam et al., 2024; Gobeze, 2018).

Prior research contends that WMPs are among the important dimensions of logistics management practices influencing business performance in manufacturing firms. For instance, a study by Odhiambo et al. (2017) reveals that effective storage management systems influence organisational performance by

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increasing output and efficiency in operations. Studies by Ndiwa and Chege (2022), Panigrahi et al. (2022), Omwenga (2021), and Makena and Elizabeth (2021) also found that material handling and inventory control management have a significant effect on the quality of such products, particularly with reference to the food and steel manufacturing companies in Kenya. Further, Cozzolino and De Giovanni (2023) report that packaging management leads to enhancement in the proper handling of products meanwhile ensuring the product's preservation.

Yet, there is scant evidence documented on WMPs in relation to grapes processing firms (Makena & Elizabeth, 2021; Ndiwa & Chege, 2022; Panigrahi et al., 2022), especially with reference to emerging economies. Nevertheless, literature has indicated that WMPs differ across firms (Odhiambo et al., 2017; Omwenga, 2021; Panigrahi et al., 2022). This study focused on WMPs in SSGP firms to provide a detailed understanding of the unique challenges they face in implementing warehouse operations. These challenges include the perishability of grapes, resource constraints, and the need for efficient operations to maintain quality and profitability. It is then worthwhile to examine WMPs among SSGP firms in the Dodoma Region for decision-making and to provide valuable insights into improving efficiency and quality in grape processing. Similarly, the study was also designed and then carried out in response to the call made by several observers (Alam et al., 2024; Jelle, 2020; Muchaendepi et al., 2019). Therefore, the study was, in particular, set to focus on the WMPs by taking several considered factors to be key, including material handling, storage, inventory control and packaging management in small-scale grapes processing (SSGP) firms in Dodoma region, Tanzania.

In Tanzania, literature reported that small scale processing firms, including those in the grapes processing industry, have contributed to economic growth which, account for about 40% of total employment and contributing roughly a third of the country's GDP (Kisinga et al., 2024; Mang'ana et al., 2023; Mashenene & Kumburu, 2023; Nalyoto & Ngaruko, 2022). Additionally, Lubawa and Osabuohien (2023), Lubawa and Raphael (2023) emphasise that SSGP firms not only create jobs but also promote economic diversification by converting grapes into products like wine, juice, champagne, jam, and raisins, thus adding value to agricultural produce. They also underscore the role of SSGP firms as a crucial link in the grape value chain, encompassing producers, processors, exporters, wholesalers, retailers, consumers, and researchers. Similarly, Kalimang'as et al. (2021) found that the efficiency and effectiveness of SSGP firms encourage smallholder farmers to adopt better farming practices, leading to higher yields and increased incomes. Therefore, understanding the effect of warehouse operation among SSGP firms is crucial as these firms play a significant role in enhancing agricultural productivity in Tanzania.

Despite the critical role of WMPs in boosting efficiency and effectiveness in managing the movement and storage of goods, many small-scale processing enterprises in developing countries continue to face stagnation and even collapse in their early stages of operation (FAOSTAT, 2023). For example, in Tanzania, 70% of small-scale processing firms have stagnated or collapsed within five years of their establishment (Kipene et al., 2015; Nkwabi & Fallon, 2020; Tisimia, 2014). This stagnation and collapse have negatively impacted the Tanzanian economy, with local firms struggling to meet domestic and international market demands, thus missing out on potential revenue (Luoga, 2019; Seme, 2021). As a result, researchers have studied various factors influencing the performance of small-scale processing enterprises, including Kisinga et al. (2024), Lubawa and Osabuohien (2023), Lubawa and Raphael (2023), Mashenene and Kumburu (2023), Mang'ana et al. (2023), Njiku (2019), and Kipene et al. (2015). However, these studies have not specifically examined the impact of warehouse management on a firm's business performance.

On the other hand, examining the business performance of small-scale processing firms is crucial as it enhances firms to strengthen their market position and understand their operations, management policies, and strategic decisions. Further, Zada et al. (2021) argued that the more small scale processing firms perform efficiently, the more they stir economic activities that lead to countries' welfare and growth. On the other hand, research studies revealed that WMPs are one of the important dimensions of processing firms' efficient performance (Etukudo & Babatola, 2023). However, several attempts have been made to document the effect of WMPs on the overall supply chain performance with limited attention towards the linkage of WMPs and business performance. This study intends to bridge this gap. The proposed solution could improve SSGP firms' business performance, create employment, generate revenue, improve warehouse operational strategies, and contribute to Tanzania's sustainable industrialisation goal.

However, there is no single approach to measuring business performance (Manogna & Mishra, 2022). Experts suggest that business firms can assess their performance using either subjective or objective information, or a combination of both, with a focus on achieving the firm's goals (Kara & İpekçi, 2022; Kellermanns et al., 2012). The challenge arises when small-scale firms are reluctant to publicly disclose their objective performance information (Lubawa & Raphael, 2023; Zulkiffli & Perera, 2011). Therefore, considering the real conditions faced by small-scale processing firms in general (including SSGP firms), this study measured business performance using subjective information-related statements that indicate whether the firm's goals have been met (Kellermanns et al., 2012; Mang'ana et al., 2023; Mwangangi, 2016).

The rest of this paper is organised as follows: Section Two presents the theoretical review and hypotheses development, Section Three describes the research methodology applied in this study, Section Four presents the findings, and Section Five presents the conclusion and recommendation.

## 2. Literature review

### 2.1. Theoretical underpinnings

#### 2.1.1. Resource based theory (RBV)

Resource-Based View (RBV), developed by Barney (1991), guided this research under the assumption that every firm is heterogeneous from other firms in terms of resources and capabilities. RBV argues that firms that possess unique capabilities and resources characterised by certain attributes are more likely to enhance business performance (Hesty & Alamanos, 2023; Kara & İpekçi, 2022). Mahmud et al. (2022) comment that firms' resources are believed to be helpful in a situation where there is a capability of facilitating the implementation or conception of strategies that exploit market opportunities that believe in improving performance and neutralising potential threats. The assumption of the theory is built on resources, including tangible resources (physical capital, financial, and technological resources). Also, the theory considers intangible resources, namely human capital, intellectual property, brand reputation, and organisation culture, in building the firm competitive advantage. Similarly, the theory postulates that a firm's capabilities revolve around innovation, operational efficiency, and logistics management. Scholars believe that the synergy between tangible and intangible resource in the RBV assumptions brings heterogeneity for achieving competitive advantages (Utami & Alamanos, 2023). Therefore, by focusing on these resources, SSGP firms can build a competitive edge, even with limited overall resources, leading to improved business performance.

Similarly, RBV explains how SSGP firms can leverage their internal resources and capabilities for efficient warehouse operations and gain a competitive edge. The application of this theory in the context of small-scale processing firms in Tanzania is crucial for navigating the unique regional challenges the SSGP firms face. Studies noted that Tanzania's small-scale processing enterprises face challenges related to limited innovation and difficulty in adopting new technology, inadequate funds and the lack of quality raw material for processing (Nkwabi et al., 2019). Also, market access, high competition and poor infrastructure, as well as inadequate storage facilities for raw materials, are cited as bottlenecks to the performance of small-scale processing firms (Dube et al., 2018; Njiku, 2019). Similarly, studies note that agro-processing facilities, modern processing equipment, and processing skills are prerequisites for the business performance of small-scale processing firms in Tanzania (Nandonde et al., 2015).

Consequently, the ability to forge strong WMPs becomes a critical resource, enabling firms to leverage warehouse operations. Firms that can effectively manage material handling, storage, controlling their inventory, and managing packaging and resources are more likely to perform better. These specific resources and capabilities highlight the importance of RBV in understanding and addressing the unique challenges faced by small-scale processing firms in Tanzania. Likewise, the theory has well been used by previous scholars (Mang'ana et al., 2023; Mashenene & Kumburu, 2023; Salisu & Abu Bakar, 2019) to elucidate the internal resources and capabilities that small-scale processing organisations need to possess to improve their business performance. Therefore, RBV is of particular relevance in this study as it serves as a stepping stone for understanding SSGP firms in the context of Tanzania.

Despite the relevance of RBV to the study, the theory has overemphasised the internal resources, namely human resources, financial resources and physical resources. Such emphasis becomes too general

and ignores the external environment under which the firm is operating. Thus, there is a need for another theory, such as dynamic capability, that integrates and reorganises internal specific resources and capabilities like skills and competencies (both internal and external) to meet the challenges of a dynamic environment (Ludwig & Pemberton, 2011). Similarly, Gligor and Holcomb (2012) and Barney (1991) argue that a firm's resources are linked to capabilities and capabilities to performance. Therefore, to complement RBV, the dynamic capabilities theory was introduced to explain the essential aspect related to how small-scale firms use their internal capabilities to adapt their resources to changing market conditions to enhance their business performance.

### **2.1.2. Dynamic capability theory**

Dynamic Capability Theory (DCT), developed by Teece et al. (1997), was adopted in this study as an extension of RBV to accommodate the changing environment. The theory assumes that business performance in an environment of rapid changes and technological advancement can be ensured by mastering the firm's own internal resources processes (Teece et al., 1997). According to DCT competitive survival of the firm in response to rapidly changing contemporary business conditions depends on the ability of the firm to sense (identify opportunities and threats), seize (take action), and transform (changing existing resources or creating new ones). A study by Barney et al. (1987) recognises the concept of dynamic capabilities as the extension of RBV as it emphasises the importance of flexibility, agility, and adaptability. While RBV focuses on static resources, dynamic capabilities highlight the dynamic processes that allow firms to evolve (Tukamuhabwa et al. (2023). Therefore, DCT, together with RBV, enhances a firm to better align their resource allocation, strategic planning, and innovation efforts, leading to achieving a competitive advantage, thus improving business performance (Barney et al., 1987; Sandberg and Abrahamsson (2011).

In the context of SSGP firms, DCT has been used to understand the dynamic nature of resource management to survive in a competitive environment. DCT recognises the ability to integrate logistics capabilities across firms' operations (including WMPs) can be considered a dynamic capability. The DCT is relevant to our study in that it explains the way firms develop firm-specific competencies to address rapidly changing environments. They refer to the capacity of the firms to cultivate adaptability, innovation, resource optimisation, and efficient operations in WMPs; these dynamic capabilities become a firm's secret weapon, enhancing SSGP firms to turn challenges into opportunities. Previous scholars (Dyduch et al., 2021; Kihara, 2018; Zhang et al., 2023) have used the dynamic capabilities theory to empower small-scale processing firms to navigate challenges, enhance resilience, create value, gain competitive advantage, and thus achieve better business performance. Therefore, DCT is essential for providing an understanding to SSGP firm managers on how to stay competitive and achieve long-term business performance.

## **2.2. Hypotheses development**

### **2.2.1. Material handling practices and business performance**

Material handling management practices are essential for processing firms (Hemant et al., 2019). This is because they facilitate shorter operating cycles, reduce handling costs, maintain the quality of materials, and promote efficiency within a warehouse (Staff, 2024). A study by Garcia-Diaz and Smith (2024) argues that ineffective material handling leads to a prolonged operating cycle, increased handling costs, and lower quality of raw materials and finished products, leading to loss of sales and revenue, thus affecting the firm's business performance. Oluyemisi et al. (2022) also reveal that effective material handling minimises product damage and enhances product quality, leading to increasing sales and thus improving business performance. Likewise, Orbetron (2024) and Vimal Arokyadass (2024) comment that the management of material handling increases efficiency processes within a warehouse by ensuring materials and work in progress flow smoothly, which reduces unnecessary costs and thus enhances firm performance. Most of the reviewed studies concentrate on the impact of material handling practices on brewery companies (Garba, 2020; Joseph & Odeleye, 2021), dairy processing firms (Makena & Elizabeth, 2021), cement manufacturing firms (Kathurima et al., 2016), construction projects (Jusoh & Kasim, 2017), and

bottling company (Unam, 2012). However, these studies did not consider the role of material handling from the perspective of SSGP firms. This study, therefore, intends to fill that gap by examining the role of material handling practices in SSGP firms. Hence, we propose the following hypothesis:

*Hypothesis 1: Material Handling Practice has a positive significant influence on the Business Performance of SSGP firms in Dodoma, Tanzania.*

### **2.2.2. Storage management practices and business performance**

Storage management practices are crucial for processing firms as they help maximise available space, ensure inventory safety, minimise damage and spoilage, and ensure the timely availability of products within a warehouse (Sharma et al., 2023; Zhao et al., 2023). A study by Sunol (2024) argues that poor, disorganised storage can slow business processes and increase the risk of damage or loss of stored products, thus affecting business performance. Kulwijila et al. (2018) and Agriopoulou and Stamatelopoulou (2017) also add that improper storage practices lead to post-harvest losses, spoilage, and diminishing quality of stored goods, leading to affecting a firm's performance. Additionally, Kotane and Kuzmina-Merlino (2017) argue that effective storage management enhances a firm in cost reduction, maintenance of product quality, improved operational efficiency, and enables the firm to adapt to market changes, thus improving business performance. Similarly, Atlas (2024) comment that managing storage practices helps the firm develop valuable and differentiated resources that contribute to its business performance. Most of the reviewed studies concentrate on the effect of storage management practices on maize and beans warehouses (Chidege et al., 2024), carrots warehouses (Etukudo & Babatola, 2023), pharmaceuticals companies (Linda & Vorvick, 2020), construction projects (Misron et al., 2018) and supermarket (Odhiambo & Janet, 2016). Nevertheless, these studies did not consider the role of storage management from the perspective of SSGP firms. This study, therefore, intends to fill that gap by examining the role of storage management practices in SSGP firms. Hence, we propose the following hypothesis:

*Hypothesis 2: Storage management practice has a positive significant influence on the business performance of SSGP firms.*

### **2.2.3. Inventory control practice and business performance**

Inventory control practices are a critical aspect of warehouse operations as they enhance inventory optimisation by ensuring enough amounts of raw materials to facilitate a seamless flow of production and sales while preventing both excesses and shortages (Gobeze, 2018). Nevertheless, Alam et al. (2024) showed that ineffective inventory control leads to accumulating excessive inventory for a time with cash tied up in it, leading to the inability to control inventory levels effectively, which affects business performance. On the other hand, Orobia et al. (2020), Muchaendepi et al. (2019), and Atnafu and Balda (2018) reveal that effective inventory control leads to improved efficiency of a business in utilising its capital resources to generate revenue, resulting in enhanced business performance. Most of the reviewed studies focus on the influence of inventory control practices on malt factories (Atlas, 2024), dairy processing firms (Ndiwa & Chege, 2022), pharmaceutical companies (Jelle, 2020), textile manufacturing firms (Musau et al., 2017), and flour milling firms (John et al., 2015). However, these research works did not consider the role of inventory control practices from the perspective of SSGP firms. This study, therefore, intends to fill that gap by examining the role of inventory control practices in SSGP firms. Hence, we propose the following hypothesis:

*Hypothesis 3: Inventory control practice has a positive significant influence on the business performance of SSGP firms.*

### **2.2.4. Packaging management practice and business performance**

Packaging management practice is essential for processing firms as it enhances product protection, storage efficiency, and quality preservation to improve market value while optimising space utilisation and ensuring sustainable product condition (Cozzolino & De Giovanni, 2023; Kim & McDonald, 2018). A study

by John Ducard (2015) reveals that ineffective packaging management can affect the quality of products, leading to the product reaching the final consumer in poor condition, that affecting firm performance. Nonetheless, Kaestner et al. (2023) and Anand and Popa (2022) comment that packaging management enhances the performance of manufacturing firms when transporting to distribution centres by protecting product and safety, enhancing easy handling, storing, picking and minimise mechanical shock and vibration while on transit. Most of the reviewed studies focus on the impact of packaging management practices on grains processing firms (Kim & Lee, 2022), the pharmaceutical industry (Origin Ltd., 2022), dairy processing firms (European Dairy Association, 2020), and meat and poultry processing firms (Lauren Wicks, 2022). These studies did not consider the role of material handling from the perspective of SSGP firms. This study, therefore, intends to fill that gap by examining the role of packaging management practices in SSGP firms. Hence, we propose the following hypothesis:

*Hypothesis 4: There is a positive significant relationship between packaging management practices and the business performance of SSGP firms.*

### **2.3. Literature on the impact of warehouse management practices on the performance of small-scale grape processing firms**

Next is the matrix summary of the related literature review that validates the claim that there are limited or insufficient studies on the effect of WMPs on the performance of SSGP firms, as presented in Table 1.

### **2.4. Conceptual framework**

In this research, the conceptual model integrates four practices derived from the RBV framework. These indicators represent the capabilities or resources of an enterprise and include material handling, storage, inventory, and packaging practices. The practices serve as a proxy for WMPs (Kidane, 2021; Ristovska et al., 2017). SSGP firms anticipate the management of these practices within a warehouse will ensure effective warehouse operations and, in turn, attain optimal business performance. Figure 1 depicts.

## **3. Methodology**

### **3.1. Research design and study area**

This study followed a cross-sectional survey design chosen for its ability to capture a momentary overview of the outcomes and features of SSGP firms at a particular moment. The research was carried out in Dodoma City, in Tanzania, deliberately chosen due to the fact that the wine industry in Tanzania is concentrated exclusively in the Dodoma Region, including Dodoma City, and ranks as the second largest producer of wine in Sub-Saharan Africa, following South Africa (Kalimang'as et al., 2021). Furthermore, the majority of grape processing facilities in Tanzania are concentrated in Dodoma City, further reinforcing its status as the notable hub for grape-based economic activities in Tanzania (Kulwijila et al., 2018). Additionally, the region's climate and soil conditions are well-suited for grape cultivation (Nyagango et al., 2023).

The decision to concentrate this study on SSGP firms was motivated by the recognition that these enterprises constitute a significant yet understudied component of Tanzania's agricultural economy (Lubawa & Osabuohien, 2023; Lubawa & Raphael 2023; Richter et al., 2021). By doing so, we will be highlighting the importance of SSGP firms in supporting local grape farmers by providing adequate markets for their agricultural produce. Additionally, these firms play a big role in supporting wine tourism in Tanzania. Hence, this study included SSGP firms characterised by a staff size ranging from 1 to 49 individuals or an investment capital of up to TZS 200 million, as recommended by the SMEs policy of 2002 and further acknowledged by Kisinga et al. (2024), Adamu (2018) and Njiku (2019). Additionally, a study by Francisco and Canare (2018), Kipene et al. (2015), and (Kellermanns et al., 2012) also suggested that when dealing with small-scale firms, it is essential to collect data within the range of 3 years to be consistent as it is a reasonable time for assessing the growth of the business. Hence, this study focuses on small-scale firms that have been in operation throughout the three years preceding the survey, specifically from 2020 to 2022.

**Table 1.** Literature review chat validating the claim that there are limited studies on the effect of WMPs on the performance of SSGP firms.

S/n	Author and Year	Place	Title	Variable studied	Sample size used	Relationship Identified	Identified Gaps
1	Ndiwa, & Chege, (2022);	Kenya	Inventory Management Practices and Supply Chain Performance of Dairy Processing Firms in Kiambu County, Kenya	Information integration, transportation system, material handling, and warehousing system	96 dairy firms	Inventory management practices have a positive influence on supply chain performance.	Descriptive statistics and multiple linear regression were used, focusing on the Dairy firm; a small sample for generalisation, geographical limitation, and the impact of WMPs on the BP of the SSGP firm was not studied, focused on larger firms.
2	Garba (2020)	Nigeria	The effect of material management on the performance of Benue Brewery Industry, Nigeria	Lead time and stock valuation	151 respondent	Material handling had a positive and significant relationship	Descriptive statistics used, Geographical limitation, Focus only on the brewery industry; the impact of WMPs on the BP of SSGP firm was not studied, focused on larger firm
3	Makena & Elizabeth, 2021	Kenya	The Effect of Material Handling Procedures on the Supply Chain Performance of Mount Kenya Dairies	Handling equipment, rate of movement, lead time, and cost-saving.	58 employees	material handling had a significant influence on the performance	-Descriptive survey research design, correlation, and regression statistical techniques -Limited sample size -Did not focus on SSGP firm -The impact of WMPs on the BP was not studied, -Focused on Larger firm
4	Kathurima et al., 2016	Kenya	Effects of materials handling systems on the performance of cement manufacturing firms in Machakos county	automating material handling systems, information-directed systems, and semi-automated systems	60 employees	there was a positive and significant effect of automating material handling systems on performance	-Regression analysis model -Limited sample size -Did not focus on SSGP firm -The impact of WMPs on the BP was not studied, -Focused on Larger firm
5	Unam, 2012	Nigeria	Materials Management for Business Success: The Case of the Nigerian Bottling Company Plc	material wastage and profitability	92 employees	There is a positive significant relationship between efficient Materials Management and firm success	-Descriptive statistics and Chi-square test statistics used -Did not focus on SSGP firm -The impact of WMPs on the BP was not studied, -Focused on a larger firm -Geographical limitation
6	Cozzolino and De Giovanni (2023)	Italy	Portfolios of sustainable practices for packaging in the circular economy: an analysis of Italian firms	facilitation of recycling activities, logistics optimisation, optimisation of production processes, raw material saving, reuse of packaging, simplification of the packaging system, and use of recycled materials.	603 circular packaging projects	There is a positive relationship between sustainable practices adopted by firms to improve packaging circularity and reduction in environmental impact	-Geographical limitation -descriptive and prescriptive analyses used -Did not focus on SSGP firm -The impact of WMPs on the BP was not studied, -Focused on Larger firm

*(Continued)*

Table 1. Continued.

S/n	Author and Year	Place	Title	Variable studied	Sample size used	Relationship Identified	Identified Gaps
7	Odhiambo & Janet, 2016	Kenya	Effect of Storage Systems on the Organizational Performance: Study of Holdings Within Kisumu City	Storage system (Open storage system, closed system, random access system, centralised system); Organisational efficiency (safety, minimum obsolescence, high output, accuracy); Intervening variables (Location variables, nature of the organisation)	85 employees	There is a positive relationship between Storage Systems and Organizational Performance	-Geographical limitation -descriptive statistics used -Focus only on supermarkets -Did not focus on SSGP firm -The impact of WMPs on the BP was not studied, -Focused on Larger firm
8	Jelle, 2020	Kenya	Influence of Inventory Management Systems on the Performance of Pharmaceutical Companies in Kenya	Inventory management systems, technological, cultural, and performance metrics	75 workers	Inventory Management Systems have a positive and significant relationship with performance	-Regression and correlation methods used -Did not focus on SSGP firms -The impact of WMPs on the BP was not studied, -Focused on Larger firm
9	Joseph, & Odeleye, (2021);	Nigeria	Effect of Material Management on the Performance of Benue Brewery Industry, Nigeria.	Material handling, productivity, and performance	50 employees	Material management has a positive effect on performance	-Focus only on Nigerian Brewery -Geographical limitation -Did not focus on SSGP firm -The impact of WMPs on the BP was not studied, -Focused on Larger firm
10	Gobeze, K. D. (2018)	Kenya	The Assessment of Inventory Management Practice: The Case of Awash Wine Share Company (AWSC)	Optimal stock levels, purchase notification, Flexible production schedule, warehouse location identification, and health and safety management	76 employees	Inventory management practices are negatively affecting AWSC	-Descriptive statistics used -Geographical limitation -Did not focus on SSGP firm -The impact of WMPs on the BP was not studied, -Focused on Larger firm
11	Omwenga (2021)	Kenya	Influence of Logistics Practices on the Performance of Food Manufacturing Firms	Material management, inventory management, and transport management	234 firms	Logistics Practices have a positive relationship with a firm's performance	-limited to the food manufacturing firms -Geographical limitation -Did not focus on SSGP firm -The impact of WMPs on the BP was not studied, -Focused on Larger firm

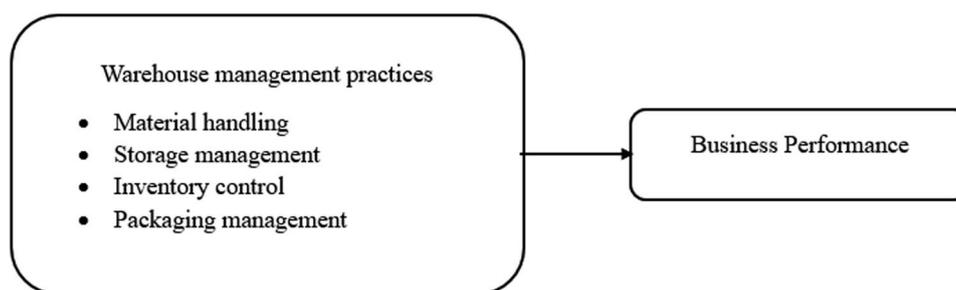


Figure 1. Conceptual framework.

Source: Author's construction, based on theoretical and empirical literature review (2023).

### 3.2. Data

Data for the study was obtained through a survey questionnaire that was administered to active SSGP firms in Dodoma that are listed by the Small Industry Development Organization (SIDO) (URT, 2022). The researchers employed purposive sampling to deliberately select firm owners as participants. This approach

was selected because firm owners, as senior informants, are regarded as more credible sources of data compared to those in junior positions (Lubawa, 2021). Before the main data collection, the study's questionnaire was tested on a distinct set of 30 SSGP enterprises that were not part of the core data collection.

The researchers conducted a pilot test of the questionnaire to gather observations and recommendations, which were then incorporated to strengthen the final data collection procedure. This process aimed to ensure the validity and reliability of the questionnaire. The questionnaire specifically sought to obtain information regarding the management of material handling, storage, inventory control and packaging practices. The study employed a census approach to gather data from the 202 small-scale grapes processing firms in Dodoma City (URT, 2022). This method was chosen because the population was sufficiently small to facilitate a thorough enumeration, thereby ensuring comprehensive, accurate, and reliable data. Thus providing a detailed understanding of the industry, leading to the elimination of the potential bias that can arise from sample errors, and ensuring that the data accurately reflects the characteristics of the entire population. Therefore, our analysis included all 202 currently operating small-scale processing firms located in Dodoma City.

### **3.3. Measurement of study variable**

#### **3.3.1. Dependent variable**

This study employed business performance as the dependent variable, utilising a combination of financial and non-financial indicators. The indicators selected for this purpose included growth in market share, growth in sales, growth in profit, and asset *growth* (Kisinga et al., 2024). These indicators are commonly used in small business performance assessments (Forth & Bryson, 2019; Kiyabo & Isaga, 2020). To measure these indicators, a five-point Likert scale was employed, ranging from 1 ('Not at all') to 5 ('Very great extent').

The study employed four validated statements using subjective metrics to assess business performance derived from previous research conducted by Lubawa and Osabuohien (2023), Lubawa and Raphael (2023), Razzak et al. (2021), Kellermanns et al. (2012), and Zulkifflia and Perera (2011). Subjective measures were selected due to the common reluctance of small-scale business owners to disclose financial data and maintain comprehensive financial records. Research indicates that subjective metrics are strongly correlated with objective measures and are recognised as reliable and valid tools for evaluating performance in small businesses (Hatidja et al., 2021).

#### **3.3.2. Independent variables**

The study operationalised and assessed the WMPs of SSGP firms by adapting variables from previous research. This approach allowed the researchers to build upon established theoretical and empirical foundations, ensuring the validity and reliability of the key constructs measured in the study. Therefore, independent variables include material handling practices (MHP) borrowed from Joseph and Odeleye (2021), measuring the effectiveness and efficiency in transferring, storing, and managing goods from the manufacturing stage to storage and dissemination. Storage management practice (SMP) was adopted by Miron et al. (2018), measuring the effectiveness and efficient storage of goods in a conducive environment, while inventory management practices (IMP) were adopted by Ndiwa and Chege (2022), Alam et al. (2024), Orobia et al. (2020) and Musau et al. (2017) concerning the management of a firm's inventory levels within a warehouse. Further, packaging management practice (PMP) was adapted from Kaestner et al. (2023) focusing on monitoring and controlling the quality of the packaging materials to ensure that they safeguard the product quality. WMPs used a five-point Likert scale to assess the primary constructs, with a range of values from 1 = strongly disagree to 5 = strongly agree.

### **3.4. Reliability and validity**

The suggested model's construct validity and reliability were evaluated using three key indicators: Composite Reliability (CR), convergent validity, and discriminant validity. Composite Reliability, convergent validity, and discriminant validity were employed to analyse these aspects. The results are presented in Table 2. The

proposed model exhibited strong reliability, supported by the indicated reliability indices: MHP (CR = 0.889), STP (CR = 0.901), ICP (CR = 0.815), and PMP (CR = 0.922). Therefore, both WMPs and company performance have dependability values exceeding 0.7, indicating a high level of reliability for each construct.

The results indicated that the Average Variance Extracted (AVE) of the constructs ranged from 0.524 to 0.666, demonstrating convergent validity. The statistics provide strong evidence for the convergent validity of the study since the AVE values meet the criterion of being greater than or equal to 0.50 and lower than the CR. In addition, we performed more rigorous assessments of discriminant validity using the Maximum Shared Squared Variance (MSV). The results showed that the MSV was consistently lower than the AVE for each concept, which further supports the presence of discriminant validity.

### 3.5. Data analysis

Covariance-based Structural Equation Modelling (CB-SEM) was utilised to investigate the relationship between WMPs and business performance. CB-SEM, a potent statistical approach widely applied in the social sciences, finds diverse applications ranging from examining fundamental connections between variables to intricate assessments of measurement equivalence for both basic and advanced constructs (Edeh et al., 2023; Nasution et al., 2020). Comprising Confirmatory Factor Analysis (CFA) and Structural model, as proposed by Anderson and Gerbing (1988), CFA illustrates the pattern of observed variables for the latent constructs hypothesised in the model. On the other hand, the structural model illustrates the relationships among unobserved variables.

#### 3.5.1. Measurement model

The study employed CFA to evaluate the reliability and validity of WMPs and business performance. The fit statistics for the proposed model are shown in Table 3. The findings show that the proposed model fit values are close to the cut-off points used to evaluate fitness. The /df index of the model is 3.879. This value is less than 5, which is the recommended value indicating that the proposed model provides a better fit to the data than alternative models. Moreover, the obtained values for the Goodness of Fit Index (GFI) (0.908) and the Comparative Fit Index (CFI) (0.936) both exceed the recommended value of

**Table 2.** Indicators of reliability, convergent and discriminant validity.

Construct (s)	CR	AVE	MSV
Material Handling	0.889	0.572	0.188
Storage management	0.901	0.604	0.188
Inventory Control	0.815	0.524	0.007
Packaging management	0.922	0.666	0.159

Source: Survey data (2023).

**Table 3.** Fit statistics of the confirmatory factor analysis for the influence of warehouse management practices on business performance.

Category	Fit statistic	Recommended	Obtained	Interpretation
Absolute fit indices	$\chi^2$	–	2791.975	Excellent
	Df	–	203	Excellent
	$\chi^2/df$	<5	3.879	Acceptable
	RMSEA	<0.05	0.020	Acceptable
	PCLOSE	>0.05	0.058	Acceptable
	GFI	>0.90	0.908	Acceptable
	AGFI	>0.80	0.871	Acceptable
	RMR	<0.05	0.037	Excellent
	SRMR	<0.08	0.065	Excellent
	Incremental Fit Indices	NFI	>0.90	0.911
CFI		>0.90	0.936	Excellent
TLI		>0.95	0.967	Excellent
IFI		>0.95	0.971	Excellent

Note: df: degrees of freedom; RMSEA: root mean square error of approximation; GFI: goodness of fit index; AGFI: adjusted goodness of fit index, RMR: root mean residual, SRMR: standardized root mean square residual; NFI : normed fit index, CFI: Comparative Fit Index, TLI: Tucker-Lewis Index, and IFI:incremental fit index.

0.9. The value of the Root Mean Square Error of Approximation (RMSEA) (0.020) is less than the recommended cut-off value of 0.05.

In Figure 2, the correlation among constructs varied from 0.06 to 0.43, suggesting an acceptable fit for our model. These results indicate that the fit statistics of the suggested CFA model were superior to those of alternative models. This suggests that the data better aligns with material handling practices, packaging management practices, inventory control practices, and store management practices.

## 4. Findings and discussion

### 4.1. Descriptive findings

#### 4.1.1. Respondents characteristics

This study achieved a 95% response rate with 202 participants who were owners of the SSGP firm. The study primarily consisted of 85.15% of respondents who were males and 14.85% female. The survey showed that 43.56% of respondents fell between the age range of 36 to 50 years, 31.68% of respondents were below the age of 35, and 24.75% of respondents were aged 50 years and older. Also, of the respondents, 46% had completed primary school, 26% had a university degree, 15% had a certificate or diploma, and 13% had completed secondary education. Table 4 depicts.

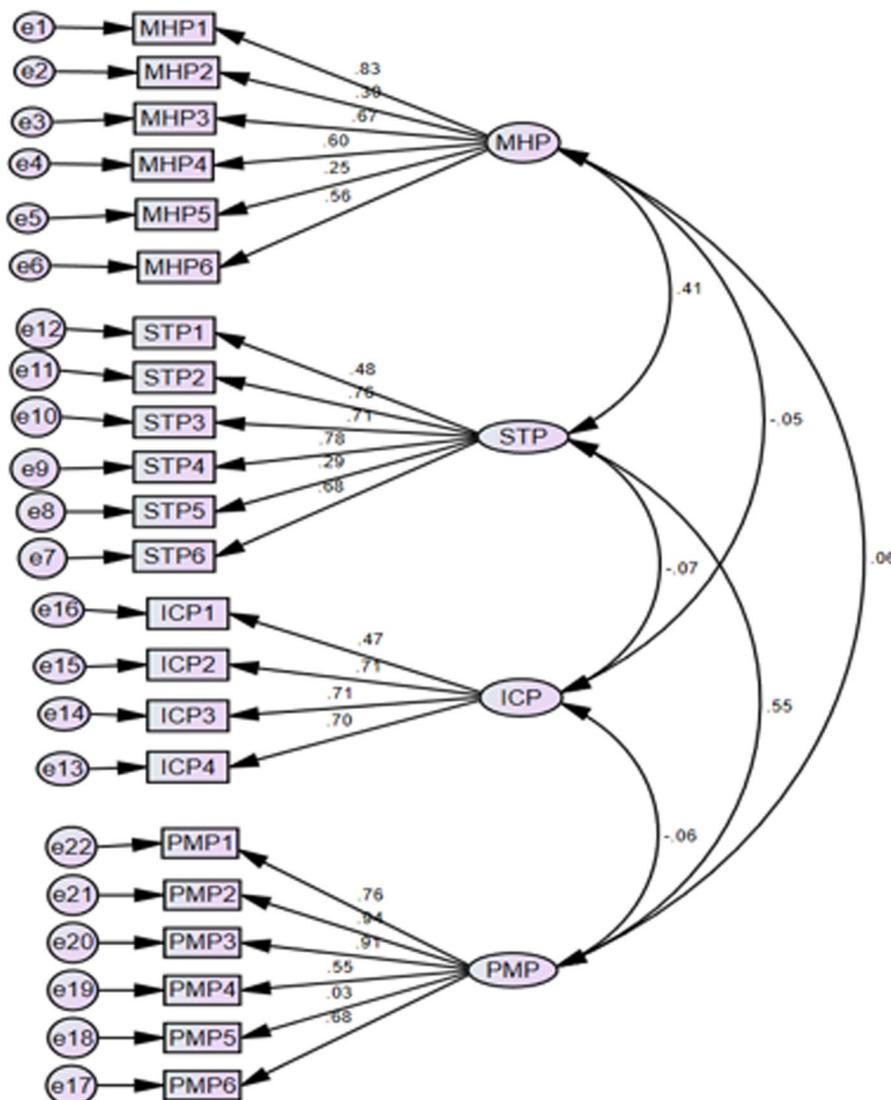


Figure 2. Displays the standardized estimates the proposed CFA model addressing the influence of WMPs on the firm's business performance.

**Table 4.** The respondents' characteristics

Variable	Frequency	Per cent
Education level		
Primary	92	46.00
Secondary	26	13.00
Certificate/Diploma	30	15.00
Bachelor	52	26.00
Gender		
Male	172	85.15
Female	30	14.85
Age		
<=35	64	31.68
36-50	88	43.56
51+	50	24.75

Source: Survey data (2023).

## 4.2. Structural model and hypothesis testing

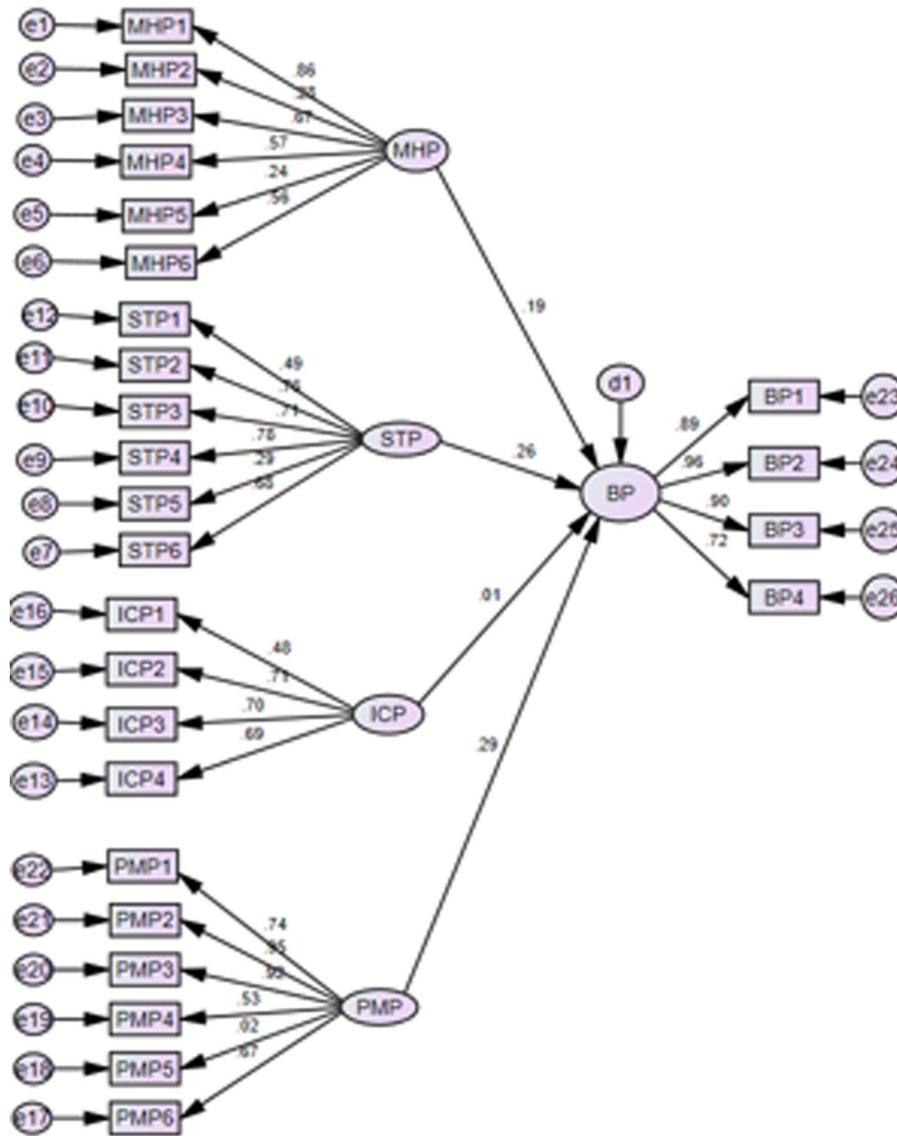
### 4.2.1. The influence of warehouse management practice on business performance

A structural model, as presented in Figure 3, was employed to test the study's hypotheses using path coefficients and P-values. Table 5 shows that approximately 58% of the variance in business performance can be explained by the WMPs considered in this study, with an  $R^2$  value of 0.581. The findings also reveal that the value of  $\beta$  represents the influence of WMPs, where a positive  $\beta$  indicates a positive impact on business performance, while a negative  $\beta$  suggests a negative effect. Additionally, the magnitude of  $\beta$  reflects the strength of the coefficient. None of the parameter estimates had a significantly larger SE. Furthermore, all CR values exceed the threshold of 1.96, confirming the robustness and reliability of the tested relationships between the study variables. Consequently, the results can be interpreted as follows:

The findings from Table 5 reveal that material handling practice has a positive impact on the business performance of SSGP firms by a 1% level of significance ( $\beta=0.112$ ,  $p=0.009$ ). Thus, H1 was supported. The findings imply that a unit increase in material handling practice results in an average increase of 0.112 in business performance. This finding could be due to the results of the optimisation of workflow within a warehouse, which reduced the chances of delays and disruption in production, reduced operational costs related to labour, product damage and transportation, improved inventory control, improved product quality and overall enhanced business performance. The finding is consistent with the results of Kathurima et al. (2016) and Joseph and Odeleye (2021), which indicate that material handling enhances a firm's performance by enabling short delivery time, reducing overall handling costs, reducing damage from poor handling, minimising labour idle time, preserving material quality, facilitating materials issuance, and ensuring on-time production of high-quality products.

It was also observed from the results in Table 5 that storage management practice had a positive impact on business performance by a 1% level of significance ( $\beta=0.249$ ,  $p<0.0001$ ). Thus, H<sub>2</sub> was supported. This means that a unit increase in in-store management practice results in an average increase of 0.249 in business performance. A plausible explanation could be due to required storage procedures, including management of storage temperature and hygiene management within a warehouse. A good storage condition is the most significant factor in producing excellent grapes products, mainly wine, to ensure consistent product quality. For instance, the capability of the SSGP firm to provide long-term storage stability of wine (e.g. six months and above) leads to improved quality of the wine. The findings are supported by Agriopoulou and Stamatelopoulou (2017) and Rocha-Parra et al. (2016), which confirm that grape products, specifically wine, are usually aged for an extended time to mature flavours after alcoholic fermentation. The studies suggest that if ideal conditions within a store, such as temperature, humidity, and light, are present during ageing, the grape product will undergo significant modifications, leading to improved quality and, hence, improving business performance.

The results presented in Table 5 illustrate inventory control practice had a positive impact on business performance by a 1% level of significance ( $\beta=0.043$ ,  $p<0.0001$ ). Thus, H<sub>3</sub> was supported. This means that a unit increase in inventory control practice results in an average increase of 0.379 in business performance. The findings imply that increased efforts in inventory control have a beneficial influence on the business performance of SSGP firms. For instance, SSGP firms primarily concentrate on overseeing two



**Figure 3.** Illustrate utilisation of path analysis in examining the correlation between material handling, storage management, inventory control, and package management.  
 Note: MPH: material handling practices; STP: storage management practices; ICP: inventory control practices, PM: package management practices; BP: business performance

**Table 5.** Parameter estimates of the structural model for the influence of warehouse management practices on business performance.

Endogenous		Exogenous	Estimate( $\beta$ )	SE	CR	p-Value	R-square
BP	<-	MHP	0.112	0.043	2.619	0.009	0.581
BP	<-	STP	0.249	0.072	3.465	<0.0001	
BP	<-	ICP	0.043	0.010	4.123	<0.0001	
BP	<-	PMP	0.379	0.635	0.597	0.550	

$p < 0.01 = 1\%$ ;  $p < 0.05 = 5\%$ ;  $p < 0.1 = 10\%$ .

Note(s): BP: business performance; MHP: material handling practices; STP: storage management Practice; ICP: inventory control practices; PMP: packaging management practice.

categories of inventory in their warehouse: semi-finished inventory, which consists of unpacked wine in storage tanks that are still undergoing fermentation, and finished inventory, which comprises packed or bottled wine that is in transit to distribution centres or customers. Therefore, efficient inventory control enables these firms to maintain optimal inventory levels and prevent stock shortages. It also facilitates the control of buffer stock to keep the continuation of the business, and re-order levels based on the seasonal availability of grapes as a raw material, ultimately ensuring the company meets market demand.

Thus enhance the business performance. The findings of this study are supported by the results of Muchaendepi et al. (2019), Orobia et al. (2020) and Atnafu and Balda (2018), who state that inventory control practices are crucial in stimulating firm performance as they enable a firm to oversee the smooth and transparent flow of material. This leads to proper management of warehousing costs and storage space with optimal resource utilisation, thus leading to improved business performance.

The results presented in Table 5 illustrate that packaging management practices had a strong influence on business performance; however, the influence was not significant ( $\beta=0.379$ ,  $p=0.550$ ). Thus, Hypothesis 4 was not supported. These findings imply that a unit increase in packaging management practices within a warehouse does not influence business performance. Despite the high coefficient observed for packaging management practices, the lack of significance aligns with findings from Edelsbrunner and Thurn (2024), and Morashti et al. (2022), all of whom demonstrated that this relationship does not attain statistical significance. In the analysis conducted for this study, it was revealed that the relationship between packaging management practices and business performance was not significant, particularly for SSGP firms. This is primarily because these firms prioritise effective packaging management only at critical stages, specifically, when grape-based products are being prepared for dispatch or transport to sales centers or end consumers. During these times, the emphasis shifts to ensuring the products reach their destination in optimal condition.

Moreover, to maintain the quality of grape-based products while in the warehouse, SSGP firms utilise specialised storage equipment, specifically plastic tanks which are suitable for food storage. These tanks are designed to protect the products from moisture, gases, light, and temperature fluctuations, keeping the inventory at the required level based on the capacity of the firm, until they are required for distribution or marketing. As a result, SSGP firms pay less attention to packaging management in the early stages of their operations, which limits its effect on their overall business success. This means that these firms tend to focus more on storage, inventory control, and handling of grapes or grapes-based product, rather than packaging at key points in the supply chain.

On the other hand, these results are in contrast to those reported by Kaestner et al. (2023), whose studies indicate that safeguarding products from environmental influences involves enhancing packaging management. They emphasise that selecting appropriate packaging materials within a storehouse is crucial for aiding product storage and convenience. Packaging serves as a barrier against various environmental factors during transit and storage, including moisture, gases, light, and temperature, thus maintaining product quality and boosting firm performance.

## 5. Conclusions and recommendations

This study examines the relationship between WMPs and the business performance of SSGP firms in Tanzania. The results show that material handling, storage and inventory control jointly affect business performance. The influence is statistically significant at a 1% level. The results provide empirical evidence that WMPs not only minimise material handling, storage and inventory control overall costs but also have a crucial impact on maintaining required standards for grape-based products and meeting market requirements. Further, among WMPs, which were significant, storage management practices show a strong relationship and positive influence on business performance. Thus, the results support the view that optimal warehouse management practices are crucial for unlocking improved business performance in the small-scale grape processing sector.

This study has practical, theoretical, and policy implications. In practical terms, it provides the firm's manager with insight into the positive impact of WMPs on business performance. By highlighting the best practices in managing warehouse operations, the study provides managers with a framework to optimise their WMP strategies and enhance their firms' overall performance. Theoretically, the study contributes to the literature on WMPs of SSGP firms in developing countries. Consistent with the reasoning, the study contributes to the existing body of knowledge by conducting a more thorough investigation of the impact of WMPs on corporate success. The current study also makes a significant theoretical contribution by addressing specific added constructs (material handling, storage management, inventory control, and packaging practices) within the context of SSGP firms in Tanzania. This extension of the RBV

theory represents an important advancement in the literature. Overall, the study's theoretical contributions expand the RBV framework and create new knowledge by addressing previously untested constructs in the small-scale grape processing industry. This advancement strengthens the theoretical foundation and enhances the generalizability of the RBV.

The study recommends that the Government, particularly through the Tanzania Ministry of Industry and Trade, should maintain a focus on policies designed to enhance WMPs. This can be achieved by implementing targeted policies and programs that support the growth and long-term viability of SSGP firms. For example, policymakers can leverage the SME policy of 2002 to introduce best practices for managing warehouse operations, particularly for perishable agricultural produce like grapes. Therefore, the Government needs to invest in WMPs within small-scale firms, as these practices significantly impact business performance.

To conclude, the study was cross-sectional, conducted only in Tanzania, and focused entirely on small-scale firms processing grapes as raw materials. Thus, generalising the study findings to other countries with different conditions should be done cautiously. Also, the study primarily employed quantitative analysis approaches. By using a single method, it is possible that contextual information could have been overlooked. To achieve a more holistic understanding of the phenomenon under investigation, future studies should consider employing a mixed-methods approach that integrates both quantitative and qualitative research methodologies. Further, other scholars could explore additional variables of WMPs, as this study was limited to four key variables: material handling, storage, inventory, and packaging management. Furthermore, the efficiency and effectiveness of WMPs in small-scale processing firms are also greatly influenced by Information and Communication Technology (ICT) (Omwenga, 2021; Panigrahi et al., 2022). However, this study did not consider the role of ICT in WMPs of SSGP firms. Therefore, it is recommended that future studies should consider the role of ICT in SSGP firms.

## Ethical approval

Ethical approval for this study was obtained from the Moshi Co-operative University (MoCU), as evidenced by the reference number MoCU/UGS/3/41, prior to commencing the data collection phase. During the data collection process, an introduction letter was presented to the respondents, clearly stating the researcher's intention to collect data for academic purposes only. As all respondents were able to read and write, written consent was obtained through the informed consent form, which they freely signed without any coercion. By signing the consent form, the respondents demonstrated their voluntary agreement to participate in the research. Therefore, respondents were free to provide their opinions on the questionnaire, as they were not subjected to any undue influence or pressure.

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## Data availability statement

The data that support the findings of this study are available from the corresponding Author, [Debora Chelestino Kisinga], upon reasonable request.

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