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ENHANCING MAIZE MARKET PARTICIPATION AMONG SMALL-SCALE FARMERS: A STUDY OF CRITICAL DETERMINANTS IN ZAMBIA. CASE OF MILENGE DISTRICT

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Abstract:
This study reconnoitres the critical elements that enhance maize marketing participation among Small-Scale Farmers (SSFs) in Zambia, specifically in Milenge District of Luapula Province. This study employs a methodological approach that involves a structured questionnaire with both open-ended and closed-ended questions, utilizing a five-point Likert scale. Participants were tasked with identifying and providing detailed insights into the critical determinants in the participation of maize marketing. The secondary data was collected from the Central Statistical Office (CSO), the Ministry of Agriculture, and the Food Reserve Agency (FRA). The outcomes of the statistical analysis revealed that certain factors significantly influence the marketability of maize. For instance, the size of the market, pricing, production levels, and the quality of maize all had a positive impact. On the other hand, poor infrastructure was found to negatively affect farmers' ability to sell their maize effectively. The study recommends that to increase market size, the government should facilitate the establishment of local cooperatives that allow small-scale farmers to pool resources and produce larger quantities of maize. This aggregation can enhance bargaining power, enabling farmers to negotiate better prices with buyers. Further, the paper recommends that to increase maize production, the government should enhance access to quality seeds and fertilizers through subsidized programs, along with providing agricultural training and expanded extension services. Supporting these initiatives would enable farmers to produce more maize, guaranteeing a higher supply and improving overall marketability.

JEL: M38, Q18, R42

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Keywords: maize marketability, pricing, production, infrastructure, small-scale farmers

1. Introduction

Small-scale farmers' participation in markets is essential for economic growth and poverty reduction in developing countries, providing opportunities for investment, income diversification, and the adoption of modern farming technologies (Heltberg & Tarp, 2002; Muriithi *et al.*, 2015). However, poor access to markets and low participation, due to barriers such as high input requirements, quality demands, and transaction costs, limit small farmers' livelihoods and perpetuate poverty (Barrett, 2008; Heltberg & Tarp, 2002). In Zambia, agricultural performance has been poor due to low productivity, high transaction costs, and inefficient markets (World Bank, 2004), with maize being a primary crop for both consumption and income. Despite maize's significance, the agricultural marketing system is plagued by challenges like high transport costs, inefficiency, and a lack of infrastructure, leading many farmers to focus on subsistence production (Dorward *et al.*, 2004).

Zambian maize production has seen a 25% decrease in the 2021/2022 season, with several factors, including unfavorable weather and poor market conditions, contributing to this decline (Food Reserve Agency, 2022). The lack of organized marketing systems, inadequate transportation, and poor storage facilities further hinder the growth of the agricultural sector (Shiferaw *et al.*, 2018; Okello *et al.*, 2017). In Zambia, government organizations like the Food Reserve Agency (FRA) and the Zambia National Farmers Union (ZNFU) are involved in agricultural marketing, but problems such as corruption and lack of market intelligence persist. The government's agricultural policies have primarily aimed at addressing market failures and improving access for small-scale farmers, but empirical evidence on these efforts has been limited. A study using data from Zambia's 2010/11 crop forecast survey found that over 50% of smallholder farmers are within 4 km of a feeder road, facilitating access to markets, though challenges in road conditions still exist. The study highlights that while market access is still an issue, many farmers use deliberate marketing strategies, such as selling directly from their farms or traveling short distances, which suggests that market access conditions may not be as dire as often portrayed.

Despite the significance of agricultural products' marketing in rural development, the dominant small-scale farmers, in the context of maize, are still confronted by a number of marketing problems. This might discourage maize production and contribute to low incomes in rural areas, and consequently retard rural development and attainment of food security. There has not been much research in comprehending the challenges that farmers face in rural areas and in Milenge District in particular. There is, therefore, a research and literature void that this study will address. This research study, therefore, aims to determine the factors influencing smallholder farmers' maize marketing, identify what makes small-scale farmers susceptible to marketing problems, and examine factors affecting smallholder farmers' market preferences.

The study aims to investigate and document the critical determinants of enhancing maize market participation among small-scale farmers in Milenge District, Luapula Province, address the challenges they face in disposing of their produce, and propose solutions to improve productivity and marketing systems.

The following specific objectives guided the study:

1) To establish how the maize quality and production per unit area affect the commercialization of maize.
2) To find out if the infrastructural facilities in existence in this industry affect the handling and flow of the commodity along the market channels.
3) To investigate how the pricing of the product impacts the marketing of maize among the small-scale farmers in Milenge.
4) To find out how the market size influences the disposal of the maize commodity by the farmers to the market.

2. Literature Review

2.1 Theoretical Review

2.1.1 The Theory of Market Transition

Market Transition Theory is all about what happens when a country's economy shifts from being state-controlled, like in the old socialist systems, to being driven by the market. The core idea is that power and success move away from government officials and into the hands of entrepreneurs. In this new system, what you know and what you can do—your skills and business smarts—become far more valuable for getting ahead than who you know in the government.

When we talk about “market transition” for a crop like maize, we are really just describing the shift from a system where the government controls everything to one driven more by supply and demand. The basic idea, borrowed from Victor Nee’s work, is that when the free market takes over from government planners, it changes who has power and what motivates people. This new setup gives small-scale farmers a real incentive to get involved and sell their crops directly.

This is used to analyze the impact of "transaction costs," the connections between markets, and even the cat-and-mouse game between traders and the government. For the system to really work for everyone, you need clear, predictable rules that allow people to build trust and operate efficiently.

2.1.2 The Theory of Price

The theory of price, or "price theory," is a microeconomic principle that states market forces of supply and demand determine the price point for goods and services (Pingali & Rosegrant, 2017). In a free market, producers aim to maximize profits, while consumers seek the lowest possible price, with the market forces finding a balance between these two (Pender & Alemu, 2017). When supply matches demand, the market reaches equilibrium, and price adjustments can occur as market conditions change (Pingali &

Rosegrant, 2017). Factors such as material availability and perceived value influence both supply and demand, affecting the overall market dynamics (Haddad & Bouis, 2017). Equilibrium is achieved when the price is set at a point where the supply meets consumer demand, and any imbalance between the two can cause prices to adjust (Pender & Alemu, 2017).

2.1.3 Agricultural Marketing Theory

The theory of agricultural marketing emphasizes the process of producing a saleable farm commodity, involving both technical and economic aspects within market structures and systems (Markelova & Meinen, 2017). It outlines that agricultural marketing encompasses pre- and post-harvest operations, including activities such as grading, storage, transportation, and agro-processing (Shepard & Andrew, 2018). These activities aim to satisfy the needs of farmers, intermediaries, and consumers, ensuring efficient handling of agricultural produce (Morocchino, 2017). The theory highlights that agricultural marketing includes the entire supply chain, whether through ad hoc sales or more integrated models like contract farming. Efficient marketing infrastructure, such as wholesale and retail markets and storage facilities, is essential for reducing post-harvest losses and mitigating health risks (Goyol & Aparajita, 2010). Markets also contribute significantly to rural development, income generation, and food security. Proponents of the theory emphasize the importance of choosing appropriate sites for markets to meet the social and economic needs of communities (Goyol & Aparajita, 2010). Moreover, successful market construction requires attention to management, operation, and maintenance to ensure long-term effectiveness (Shepard & Andrew, 2018).

2.2 Review of Related Empirical Literature

Hota *et al.* (2012) in their study viewed that cooperatives marketing occupies an important role in India's economy in terms of their coverage of rural producers, business turnover and contribution to the economic welfare of their members as well as to the rural economy of India. Deshpande and Gopalappa (2013) advised establishing an effective price monitoring system, including market information kiosks incorporating information on prices, quality, international trade centers and technology. The statistical system and database should be strengthened to improve the coverage and quality of agricultural marketing-related information and to reduce the time gap in its availability.

Reardon *et al.* (2013) in their study documented that private firms now play a dominant role in countries such as China, India, and Peru in developing improved seed varieties, producing and distributing inputs, post-harvest operations and retailing through hyper markets. Ramkishen (2016), in his research paper, argued that because of the lack of food processing and storage, the grower is deprived of a reasonable price for his produce during the peak marketing season, while the consumer needlessly pays a higher price during the lean season.

Pathak (2018) in his research paper stated that the contribution of agriculture to the growth of a nation is constituted by the growth of the products within the sector itself,

as well as the agricultural development permits the other sectors to develop by the goods produced in the domestic and international market. The investigations were conducted in Bolivia.

A study carried out by FAO (2012) showed that Zimbabwe is dominated by the agricultural sector, and it plays an essential role in the economy, contributing 15-18 percent to Gross National Product. It also provides an income to over 75 percent of the population, and in most years, 95 percent of all food and beverages are produced by cultivators. Agriculture is the primarystay of Zimbabwean economy as it accounts for a third of formal employment, and over 70 percent of Zimbabwe's population derives its livelihood from agriculture (FAO, 2012 and FEWSNET, 2014).

It has, however, been established that there is little or no official support for private traders even after liberalization in many Eastern and Southern African countries. This has inhibited the private sector's capacity to respond to the opportunities of a more liberalized market environment, according to the findings of the study done by Jones and Yao in 2018.

Smallholders have not seen a significant increase in maize yields. While there has been an upward trend in maize yields, these still remain scarcely over 2 tons per hectare, well below global averages. What increases have been observed have been largely attributed to favorable weather conditions, although increases in input use have also played a role (Burke *et al.*, 2010). The expansion of the FRA in recent years is the outgrowth of the government's response to the bountiful harvests recorded between 2010 and 2012, when it was mandated to purchase as much of the smallholder maize crop as possible in order to avoid a producer price collapse. As a result, over the same period, the FRA purchased 3.7 million MT of maize or approximately 80 percent of the available surplus (Sitko & Kuteya, 2013).

In Zambia, little or no official support was revealed by the Food Security Research Project done by Goverel *et al.* in 2016. The project demonstrated that following market liberalization in 1991, the budget share allocated to agriculture declined from 26% in 1991 to 4.4% in 1999. Inefficient marketing systems have persisted due partly to constraints encountered by traders that have hindered the creation of a competitive market. Traders operate in a highly constrained environment. Studies unanimously agree that traders encounter constraints in credit access, storage facilities and transportation (Santorum & Tibaijuka, 2018). Mwamba (2018) also showed transportation, storage and credit as the main problems faced by small-scale maize traders.

Amani and Kapunda (2017) reported that almost 73% of traders interviewed in municipalities of Morogoro, Iringa and Dodoma obtained at least part of their initial capital from mutual lending and credit in kind. Credit in kind was more often given by farmers to traders, i.e. farmers delivered over their produce to traders who returned later to pay the farmers. In contrast, private trading in newly liberalized agricultural markets in Eastern and Southern Africa tends to be characterized by very limited credit relationships between market participants (Beynon & Jones, 2017). The slow pace of private sector development after an initially dynamic response to new opportunities

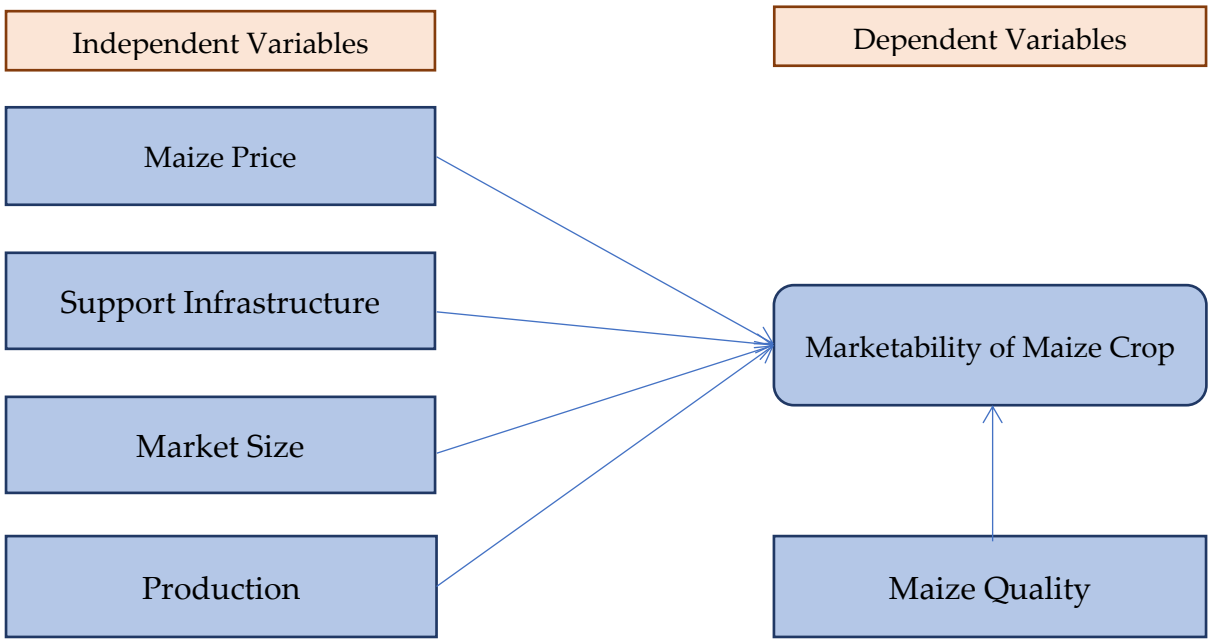
results in seasonal and interannual prices not being stabilized and segmentation between rural markets tends to remain, although urban markets may be well interrelated with each other (Beynon & Jones, 2017). Inefficient marketing results in losses.

3. Methodology

3.1 Conceptual Framework

A conceptual framework is typically derived from existing theories. It identifies the concepts included in a complex phenomenon and illustrates their relationships. The relationships are often presented visually in a flow chart, web diagram, or other form of schematic (Glatthorn & Joyner, 2015). The conceptual framework for this proposed study is derived from a review of the related literature.

Figure 1: Conceptual Framework



Source: Authors' original analysis of primary field data.

The researcher has identified several factors that affect maize marketing among small-scale farmers, including maize price, support infrastructure, market size, market structures, and production levels. The dependent variable in the study is the access of small-scale farmers to the market, while government policies are considered intervening variables, as they shape the environment for maize marketing. This study aims to enhance the understanding of factors influencing maize marketing in Milenge district and contribute to existing knowledge in the field. By examining how small-scale farmers engage in marketing and selling maize, the study provides insights that can be compared with similar research in Zambia and beyond. The findings will be valuable for policymakers, helping to identify areas for intervention to improve maize marketing practices.

3.2 Methods and Materials

3.2.1 Research Design, Data Collected, and Data Analysis

There are two approaches or methods employed in this type of research. These include deductive study and inductive study, where the former seeks to answer a research query, and the latter seeks to build a theory relating to a specific topic.

Deductive research is a research method aimed at helping researchers communicate qualitative assumptions about cause-and-effect relationships (causality), elucidate the ramifications of such assumptions, and drive causal inferences from a combination of assumptions, experiments, observations, and case studies (Neuman, 2003). It bridges the distance between the academic interests of research and the prescriptive demands of policy-making (Bernard, 2011).

The inductive approach, also known as inductive reasoning, begins as a research method where observations are made, and theories are proposed towards the end of the research process (Goddard & Melville, 2004). Because of observations, inductive research "*involves the search for patterns from observation and the development of explanations or theories for those patterns through a series of hypotheses*" (Bernard, 2016). No theories or hypotheses would apply in inductive studies at the beginning of the research, and the researcher is free in terms of altering the direction of the study after the research process has commenced.

It is important to stress that an inductive approach does not imply disregarding theories when formulating research questions and objectives. This approach aims to generate meanings from the data set collected in order to identify patterns and relationships to build a theory (Goddard & Melville, 2014). However, the inductive approach does not prevent the researcher from using an existing theory to formulate the research question to be explored (Saunders, Lewis & Thornhill, 2015). Inductive reasoning is based on learning from experience. Patterns, resemblances, and regularities in experience (premises) are observed in order to reach conclusions or to generate theories (Neuman, 2017).

A Glaser and Strauss (2017) and Creswell (2012) recommend the concept of saturation for achieving an appropriate sample size in descriptive studies. They suggested that for descriptive research, a sample size of between 30 and 500 will suffice. This is so because the addition of one more respondent would not add value to the research, but would just saturate the sample. The sampling frame for this study included all farmers in Milenge District, amounting to 1,250, according to the District Agriculture Office's current statistics. Milengi District has 15 wards. The target population in each was 8 participants.

Therefore, the targeted population was 120 small-scale farmers in Milenge District of Luapula Province in Zambia. The Yamane formula was used to derive a sample. Yamane's (1967) statistical formula is used to determine the sample size for a survey or research study, particularly when the population size is known, and the researcher wants to ensure a representative sample. It is important to note that the Yamane formula assumes simple random sampling.

The formula is given by:

$n = N/(1+N(e))^2$

Where:
n is the required sample size.
N is the population size. e is the desired level of precision (margin of error), expressed as a proportion (for example, in this study, we would take a 5% margin of error, which would be 0.05).

When we plug the values into the formula, we obtain the following:
$n = 120/1 + (120) * (0.05)^2$
$n = 120/1 + 120 * 0.0025$
$n = 120/1.3$ $n = 92.3076$
$n = 93$

Therefore, the representative sample size used in this study was 93 small-scale farmers in Milenge District.

4. Findings, Results and Discussions

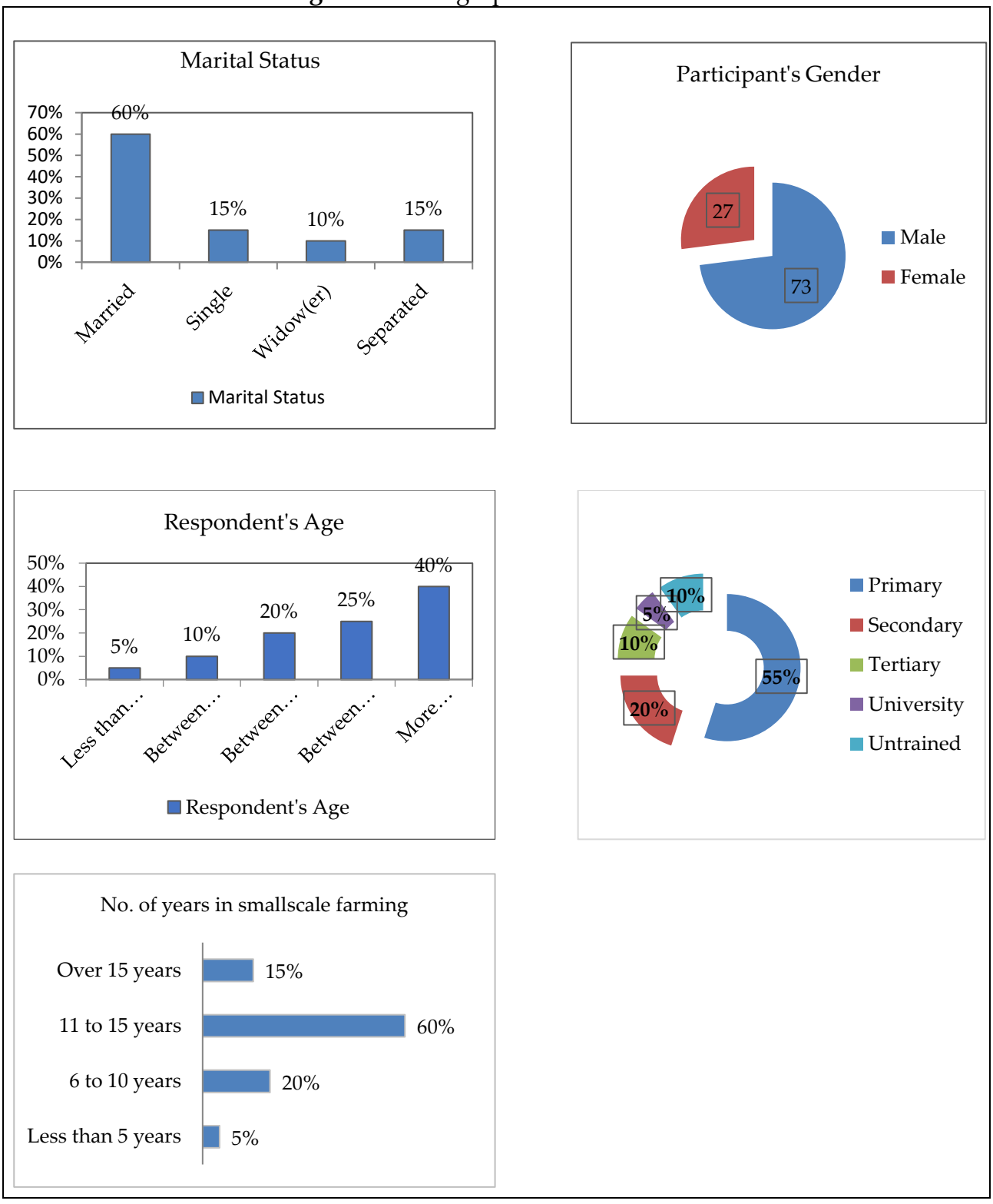
4.1 Demographic Information

This section presents the demographic information, which is important in bringing out the characteristics of the respondents participating in the study.

The figure on Gender shows that the majority of the respondents were males, who were 73% of the total sample, while 27% were female. This implies that maize farming is predominantly male-dominated in Milenge District. Further, Table 4.1 illustrates that the majority of the respondents, 60%, were married, 15% were single and separated or divorced respectively, while 10% were widowed. Since most of the farmers in this part of the country engage in subsistence farming, couples are more likely to be in a better position to invest in land and deal with potential or actual problems that maize marketing can impose. Married people may pool their resources together and combine efforts to grow and sell maize.

Table 4.1 also shows that the majority of the respondents were above 46 years, followed by those who were in the age range of 36-45 years, who were 25%. The 26-35 years age range were 20% of the total number of respondents, while the 19-25 age group were 10%. The least were in the range of 19-25, who were 5%. This implies that most small-scale farmers are older and mature farmers, possibly with families.

Figure 2: Demographic Information



Source: Authors' original analysis of primary field data.

When asked what their levels of education were, the majority, 55%, had only reached primary school level, followed by those who were secondary school leavers, where 20% of the respondents, followed by those who had reached tertiary education and those who

were untrained, who were 10 % of the total number of respondents. The lowest percentage was university graduates, who accounted for 5% of the respondents.

The figure shows that the majority, 60% of the respondents, had between 11 and 15 years of experience in small-scale farming. This was followed by those who had between 6-10 years, with 20%, and those with over 15 years' experience, who were 15% of the total sample size. Those with less than 5 years' experience were only 5%. This implies that a combined total of 75% of the farmers have over 10 years' experience that should give them enough knowledge and understanding of the marketing challenges of Maize grains.

4.3.2 Regression Model Results

The Ordinary Least Squares (OLS) regression analysis revealed key factors influencing the marketability of maize among small-scale farmers in Zambia. Market size and maize production were statistically significant, with market size having a coefficient of 0.4438, indicating a positive impact on marketability, while maize production's coefficient of 0.0000964 was also significant.

Table 1: Regression Model Results

Variable	Coefficient	Standard Error	T-statistics	P-value
Market Size	0.4438701	0.1212356	3.66	0.001
Maize Price	0.3632595	0.110915	3.28	0.002
Production	0.0000964	0.0000398	2.42	0.019
Infrastructure	-0.1621584	0.1210393	-1.34	0.186
Maize Quality	0.3876218	0.1133754	3.42	0.001
Constant	-0.2081894	0.5338364	-0.39	0.698

Source: Authors' original analysis of primary field data.

However, variables such as maize price and farm infrastructure were found to be statistically insignificant, with farm infrastructure showing a negative coefficient of -0.16215, though it remained statistically insignificant. Maize quality emerged as a significant factor at the 5% level, highlighting its importance in enhancing marketability. The constant term was found to be non-significant, further underscoring the role of the identified variables in influencing maize marketability.

4.2 Discussion of Findings

The section below discusses the study's findings.

4.2.1 Objective I. To establish how the maize quality and production per unit area affect the commercialization of maize.

The statistical analysis indicates a significant link between maize quality and marketability, with a coefficient of 0.3876 that is statistically significant at the 5 percent level, as evidenced by a probability value of 0.001, which is below the standard threshold

of 0.05. This implies that improvements in maize quality can increase its marketability by approximately 0.3876.

From a statistical perspective, the significance of maize production is evident in its probability value of 0.019, which is below the established threshold of 0.05. This result leads to the rejection of the null hypothesis, indicating that maize production positively influences marketability. The coefficient for this variable, at 0.0000964, implies that increases in production are associated with improvements in marketability, even though the effect size is relatively small. These findings align with existing research. For example, Key, Sadoulet, and de Janvry (2005) examined producers' supply responses and market participation decisions, concluding that both fixed and variable transaction costs influence market engagement. They distinguished between fixed costs, which do not depend on the quantity traded and include expenses for finding buyers, and proportional costs that vary with volume, such as transportation costs. Their analysis using Mexican data revealed that factors like high-yield maize varieties, increased mechanization, better access to credit, and higher farm-gate prices enhance production levels.

4.2.2 Objective II. To find out if the infrastructural facilities in existence in this industry affect the handling and flow of the commodity along the market channels.

The statistical analysis indicates that farm infrastructure does not significantly affect maize marketability among small-scale farmers in Zambia. With a coefficient of -0.1621584 and a probability value of 0.186, the relationship between infrastructure and maize marketability appears insignificant. Since the p-value exceeds the conventional threshold of 0.05, there is insufficient evidence to reject the null hypothesis that there is no relationship between the two. The negative coefficient further suggests that infrastructure does not enhance maize marketability. These findings diverge from those of Escobal (2005), who examined infrastructure and markets in Peru, noting that isolated infrastructure investments often yield diminishing returns unless they are effectively integrated with other initiatives. Likewise, Joshi, Joshi, and Birthal (2006) identified challenges for smallholders, such as unreliable markets and inefficient marketing systems, which can result in significant crop losses. They recommended strengthening farm-firm connections through strategies like contract farming to address these issues

4.2.3 Objective III. To investigate how the pricing of the product impacts the marketing of maize among the Small-scale farmers in Milenge.

The model's results reveal a significant positive relationship between maize price and marketability, with a probability value of 0.002, well below the conventional cutoff of 0.05. This leads to the rejection of the null hypothesis, which suggested no correlation between maize price and marketability. These findings resonate with previous research by Beadgie and Zemedu (2019), Abajobir *et al.* (2018), and Kabeto (2014), who concluded that both maize price and access to credit significantly influence smallholder farmers' participation in maize marketing. Access to credit is particularly crucial as it enables households to purchase inputs, materials, and pesticides, hire labor effectively, and

ultimately boost production. Specifically, a one USD increase in credit correlates with an increase in maize market participation by 1.445 quintals, aligning with the findings of Beadgie and Zemedu (2019) and Kabeto (2014) regarding the positive role of credit in maize trading.

4.2.4 Objective IV. To find out how the market size influences the disposal of the maize commodity by the farmers to the market.

The model's results demonstrate a significant positive correlation between market size and maize marketability among small-scale farmers, with a probability value of 0.001, indicating strong statistical significance below the 0.05 threshold. The coefficient of 0.044387 for the market size variable suggests that larger markets positively influence maize marketability. These findings align with Fafchamps (1992), who investigated cash crops in developing countries and explained why large-scale farmers tend to dedicate more land to cash crops than small-scale farmers. He found that many farmers in these regions must rely on self-sufficiency due to the isolation and limited nature of rural food markets, which are affected by high transport costs and low agricultural productivity. Fafchamps highlighted the importance of investing in roads and eliminating trade barriers to foster an environment conducive to crop specialization, emphasizing that road infrastructure is vital for agricultural markets.

These findings are consistent with the work of Omamo, who explored the connections among farm diversification, market failures, and market access relative to transaction costs and specialization (1998a, p.152). He concluded that high transaction costs influence production decisions based on distance to trade points, and excessive specialization may lead to total costs exceeding total revenues, deterring the adoption of certain production methods (Omamo, 1998). Despite higher input costs associated with cash crops, their greater potential returns justify their prominence in farm planning. Omamo also suggested that diversification is a strategic choice for farm households to achieve competitive advantages and adapt to price changes (1998a, p.161). His research on crop selection in Kenya revealed that farmers often produce more low-yield crops in response to high transportation costs, particularly affecting crops like maize that are both consumed and sold.

5. Conclusion

This study aims to explore and document the various factors affecting the marketability of maize produced by small-scale farmers (SSFs) in the Milenge District of Luapula Province, Zambia. Using a structured questionnaire that combined open- and closed-ended questions on a five-point Likert scale, participants were tasked with identifying and elaborating on how various factors affect the marketability of maize in their area.

The statistical analysis yielded significant insights into how various elements influence maize marketability among SSFs in Zambia. Specifically, factors such as market

size, pricing, production, and quality were found to have a strong positive impact, whereas infrastructure-related factors had a negative impact.

Interestingly, despite the positive contributions of the aforementioned factors, the analysis revealed that infrastructure-related factors did not have a statistically significant impact on maize marketability. This indicates that while many factors are influential, infrastructure may not play as crucial a role. Therefore, there is a need for further exploration and targeted interventions to enhance the effectiveness of infrastructure in improving maize marketability in Zambia.

6. Recommendations

The study proposed various policy measures aimed at improving the marketability of maize among small-scale farmers in Zambia:

6.1 Enhancing Market Size

To enhance market size, the government should support the creation of local cooperatives that enable small-scale farmers to pool their resources and produce maize in greater volumes. This collaboration can boost their negotiating strength, helping them achieve better prices with buyers. Furthermore, organizing frequent market fairs would provide a platform for farmers to engage directly with consumers and larger wholesalers, strengthening market connections.

6.2 Price Stabilization Mechanisms

Creating a market information system would provide small-scale farmers with up-to-date pricing data, enabling them to make better-informed selling decisions. Additionally, the government might consider setting up a strategic maize reserve to stabilize prices during times of surplus or shortage, ensuring fair compensation for farmers year-round. These initiatives could protect farmers from price fluctuations and contribute to greater income stability.

6.3 Improving Farm and Storage Infrastructure

Investing in rural infrastructure, especially roads and transportation systems, is crucial for improving market access for small-scale farmers. Better infrastructure can reduce transportation expenses and ensure the timely delivery of maize to markets. Furthermore, developing community storage facilities with suitable technology can minimize post-harvest losses and help preserve the quality of maize until it is sold.

6.4 Boosting Production Capacity

To boost maize production, the government ought to improve access to high-quality seeds and fertilizers through subsidization. Furthermore, offering agricultural training and extension services will equip small-scale farmers with contemporary farming

methods that enhance crop yields. By fostering these initiatives, farmers can increase their maize output, thereby elevating the total market supply.

6.5 Enhancing Maize Quality

Creating specific quality standards for maize is essential to boosting its marketability and enabling small-scale farmers to access higher-value markets. The government should facilitate training initiatives that emphasize optimal post-harvest handling and processing techniques to preserve maize quality and minimize spoilage. Ensuring that farmers are well-informed and able to meet these quality standards can greatly enhance their competitive edge in the marketplace.

6.6 Strengthening Market Linkages

Fostering collaborations between small-scale farmers and agribusinesses can create opportunities for contract farming, ensuring stable market access and providing essential technical assistance. Additionally, promoting digital sales platforms can empower farmers by decreasing their dependence on middlemen and increasing their profit margins. Strengthening these connections will enable small-scale farmers to achieve better market positions and enhance their overall income.

7. Suggestions for Further Studies

The focus of this study was on Milenge district in Luapula province, yet its findings may not encapsulate the full range of complexities and challenges found throughout Zambia. Given the country's regional diversity, with each area exhibiting its own socio-economic characteristics and community needs, the conclusions drawn from Milenge may not be broadly applicable. Therefore, additional research on a national scale is essential to gain a comprehensive understanding of the factors affecting the marketability of maize produced by small-scale farmers (SSFs) across Zambia. Conducting comparative analyses between different provinces or regions could uncover variations in the challenges faced and their effects on the marketability of maize from SSFs. Understanding these discrepancies would provide valuable insights for policymakers, traditional leaders, and the government, helping them better grasp the determinants of maize marketability across the nation. This knowledge can guide targeted interventions and policy refinements aimed at boosting maize marketability for SSFs in Zambia.

Authors Contribution
Nathan Tyson Mwanza and Professor Mpundu Mubanga contributed to the study design, data collection instruments, data analysis, and the writing and approval of the final manuscript.

Ethics Approval and Consent to Participate
The approval for ethical clearance was obtained through UNZABREC. The certificate was awarded to Mr. Mwanza, Nathan Tyson. Reference number: UNZA-6151/2024.

Consent for Publication
Written informed consent for the publication was obtained from the participants.

Availability of Data and Materials
The dataset, including audio recordings and transcribed data for the study, is available from the authors upon reasonable request.

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Conflict of Interest Statement
The authors declare no conflicts of interest.

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References

Abbott, J. C. (1958). *Marketing problems and improvement programs* (FAO Marketing Guide No. 1). Food and Agriculture Organization of the United Nations. Retrieved from https://openknowledge.fao.org/server/api/core/bitstreams/0e506985-b62b-47bf-952d-6789578e9e1d/content

Acharya, S. S., & Agarwal, N. L. (2011). *Agricultural marketing in India* (5th ed.). Oxford & IBH Publishing. *(Note: Acharya's definitive work is typically updated via Oxford & IBH; Mittal published his earlier 1987 edition).* Retrieved from https://ageconsearch.umn.edu/record/297615/files/ijae-246.pdf

Agresti, A. (2002). *Categorical data analysis* (2nd ed.). Wiley-Interscience. *(Note: The 2nd edition was published in 2002; the 3rd edition was published in 2013).* Retrieved from https://onlinelibrary.wiley.com/doi/book/10.1002/0471249688

Amani, H. K., & Kapunda, S. M. (1990). Agricultural market reform in Tanzania: The restriction of private traders and its impact on food security. In *Agricultural marketing in Tanzania*. Tanzania Publishing House.

An, H. B., & Moustier, P. (2005). *Vegetable market information and consultation systems in the Mekong region* [Workshop proceedings]. RIFAV, Hanoi, Vietnam. Retrieved from www.inter-reseaux.org

Bain, J. S. (1968). *Industrial organization* (2nd ed.). John Wiley & Sons. Retrieved from https://books.google.ro/books/about/Industrial_Organization.html?id=78MdN-ANtcoC&redir_esc=y

Balasubramaniyan, P., & Palaniappan, S. P. (2001). *Principles and practices of agronomy* (2nd ed.). Agrobios (India). Retrieved from https://www.abebooks.co.uk/9788177541915/PRINCIPLES-PRACTICES-AGRONOMY-2ND-ED-8177541919/plp

Bartlett, J. E., Kotrlik, J. W., & Higgins, C. C. (2001). Organizational research: Determining appropriate sample size in survey research. *Information Technology, Learning, and Performance Journal*, *19*(1), 43–50. Retrieved from https://www.proquest.com/openview/968e6436885222038106d874c370feaa/1?pq-origsite=gscholar&cbl=9497

Brunk, M. E., & Darrah, L. B. (1955). *Marketing of agricultural products*. Ronald Press Company. Retrieved from https://books.google.ro/books/about/Marketing_of_Agricultural_Products.html?id=X14tAAAAIAAJ&redir_esc=y

Carney, T. F. (1971). Content analysis: A review essay. *Historical Methods Newsletter*, *4*(2), 52–61. https://doi.org/10.1080/00182494.1971.10593939

CTA. (2016). *Lessons for sustainability: Failing to scale ICT4Ag-enabled services*. Technical Centre for Agricultural and Rural Cooperation. Retrieved from http://publications.cta.int/en/publications/publication/1925/

CTA. (2009). Sending the right message: Farmers in Zambia receive market prices on their mobile phones via SMS. *ICT Update*, (47).

David-Benz, H., Andriandralambo, N., Soanjara, H., Chimirri, C., Rahelizatovo, N., & Rivolala, B. (2016). *Improving access to market information: A driver of change in marketing strategies for small producers?* [Paper presentation]. 149th EAAE Seminar, Rennes, France. Retrieved from https://agritrop.cirad.fr/584174/1/David-Benz%20et%20al%20_Improving%20access%20to%20market%20information_EAAE%2016%2009%202016.pdf

David-Benz, H., Galtier, F., Subervie, J., & Egg, J. (2014). Agricultural market information systems in developing countries: New models, new impacts. *Cahiers Agricultures*, *23*(4-5), 232–244. https://doi.org/10.1684/agr.2014.0716

David-Benz, H., Egg, J., Galtier, F., Rakotoson, J., Shen, Y., & Kizito, A. (2012). *Agricultural market information systems in Sub-Saharan Africa: From the first to the second generation* (Focales No. 14). Agence Française de Développement. Retrieved from

https://www.afd.fr/sites/default/files/2022-05-03-48-05/QDD52_agricultural_information_systems_ssa%20.pdf

David-Benz, H., Galtier, F., Egg, J., Lançon, F., & Meijerink, G. (2011). *Market information systems: Using information to improve farmers' market power and farmers organizations' voice* (ESFIM Policy Brief No. 7). Retrieved from https://www.researchgate.net/publication/235897777_Market_information_systems_Using_MIS_information_to_improve_farmers'_market_power_and_farmers_organizations'_voice

David-West, O. (2010). *Esoko networks: Facilitating agriculture through technology* (Case Study). United Nations Development Programme. Retrieved from http://growinginclusivemarkets.com/media/cases/Ghana_Esoko_2010.pdf

De Silva, H. (2005). *An innovative fruit and vegetable market information system in Sri Lanka: The Govi Gnana (Farmer Knowledge) Service* [Paper presentation]. World Bank-USAID Post-IAMA Conference, Chicago, IL.

Delfico, J. F. (1989). *Content analysis: A methodology for structuring and analyzing written material* (PEMD-10.3.1). United States General Accounting Office.

Dembélé, N. N., Tefft, J. F., & Staatz, J. M. (2000). *Mali's market information system: Innovative evolution in support of a dynamic private sector*. Department of Agricultural, Food, and Resource Economics, Michigan State University. Retrieved from http://ageconsearch.umn.edu/bitstream/11470/1/ps56.pdf

Dubey, S., & Gennari, P. (2014). *Now-casting food consumer price indexes with big data: Public-private complementarities* [Paper presentation]. IAOS 2014 Conference, Da Nang, Vietnam. Retrieved from https://openknowledge.fao.org/server/api/core/bitstreams/1ad1a44c-52a5-4542-b0e4-f993d7025a38/content

El Fadil, A. I. (2010). *Markets & prices monitoring: Training manual*. FEWS NET & SIFSIA.

Fackler, P. L., & Goodwin, B. K. (2001). Spatial price analysis. In B. L. Gardner & G. C. Rausser (Eds.), *Handbook of agricultural economics* (Vol. 1, pp. 971–1024). Elsevier. Retrieved from https://econpapers.repec.org/bookchap/eeehagchp/2-17.htm

Fafchamps, M., & Minten, B. (2012). Impact of SMS-based agricultural information on Indian farmers. *The World Bank Economic Review*, *26*(3), 383–414. Retrieved from https://www.jstor.org/stable/41679567

Famine Early Warning Systems Network. (2009). *Commodity market maps and price bulletins: Tools for food security analysis and reporting* (Market Guidance No. 4). USAID. Retrieved from https://fews.net/sites/default/files/MT%20Guidance_Market%20Maps%20and%20Price%20Graphs%20in%20Analysis_No%204_En.pdf

FAO. (1961). *Marketing of food grains in the tropical and sub-tropical areas*. Food and Agriculture Organization of the United Nations.

FAO. (1980). *Farm and input prices: Collection and compilation* (Economic and Social Development Paper No. 16). Food and Agriculture Organization of the United Nations. Retrieved from https://openknowledge.fao.org/server/api/core/bitstreams/9747d15f-25e1-4798-bc4b-b4547a073d86/content

FAO. (2000). *Handbook for defining and setting up a Food Security Information and Early Warning System (FSIEWS)*. Food and Agriculture Organization of the United Nations. Retrieved from https://www.fao.org/4/x8622e/x8622e01.htm

FAO. (2005). *Improving information flows to the rural community* (Occasional Paper No. 9). Food and Agriculture Organization of the United Nations. Retrieved from https://openknowledge.fao.org/items/fbc49159-a8c1-4eff-b63c-8bf022a1c4e9

FAO. (2016). *Exchanging agricultural market information through SMS in Cambodia* (Technical Brief). Food and Agriculture Organization of the United Nations. Retrieved from https://www.fao.org/fsnforum/resources/reports-and-briefs/exchanging-agricultural-market-information-through-sms-cambodia

Farm Radio International. (2003). *Trusting the trader: The importance of reliable information* (Script No. 66.1).

Farm Radio International. (2011). *Marketing on the airwaves: Marketing Information Service (MIS) and radio*. African Farm Radio Research Initiative. Retrieved from https://farmradio.org/publications/marketing-airwaves-marketing-information-service-mis-radio/

Ferris, S., Engoru, P., & Kaganzi, E. (2008). *Making market information services work better for the poor in Uganda* (CAPRi Working Paper No. 77). International Food Policy Research Institute. https://doi.org/10.1684/agr.2014.0708

Ferris, S., & Robbins, P. (2004). *Developing marketing information services in Eastern Africa: The FOODNET experience* (IITA Research Guide 67). International Institute of Tropical Agriculture. Retrieved from https://cgspace.cgiar.org/server/api/core/bitstreams/8a4b5dbc-4a56-486f-8495-45ec6d5c7111/content

Fernández-Ardèvol, M., & Ros Híjar, A. (Eds.). (2011). *Communication technologies in Latin America and Africa: A multidisciplinary perspective*. IN3/UOC. Retrieved from https://ictlogy.net/bibliography/reports/projects.php?idp=1547

Forman, S., & Riegelhaupt, J. F. (1970). Market place and marketing system: Toward a theory of peasant economic integration. *Comparative Studies in Society and History*, *12*(2), 188–212. Retrieved from https://www.jstor.org/stable/177964

Galtier, F. (2013). *Managing food price instability in developing countries: A critical analysis of strategies and instruments*. Agence Française de Développement. Retrieved from https://agritrop.cirad.fr/568954/1/document_568954.pdf

Geda, A., de Jong, N., Mwabu, G., & Kimenyi, M. S. (2001). *Determinants of poverty in Kenya: A household level analysis* (ISS Working Paper No. 347). Institute of Social Studies.

Giovannucci, D., & Shepherd, A. F. (2001). *Market information services* (World Bank Knowledge Management Guide). World Bank. Retrieved from https://www.researchgate.net/publication/228217952_Market_Information_Services

Goyal, A. (2010). Information, direct access to farmers, and rural market performance in central India. *American Economic Journal: Applied Economics*, *2*(3), 22–45. Retrieved from https://www.aeaweb.org/articles?id=10.1257/app.2.3.22

Haddad, L. J., & Bouis, H. E. (1990). *Agricultural commercialization, nutrition, and the rural poor: A study of Philippine farm households*. International Food Policy Research Institute. Retrieved from https://www.cabidigitallibrary.org/doi/full/10.5555/19921896267

Hall, C. S., & Van de Castle, R. L. (1966). *The content analysis of dreams*. Appleton-Century-Crofts. *(Note: Your 2017 date likely refers to a reprint; the original theory is from 1966).* Retrieved from https://psycnet.apa.org/record/1966-06183-000

Hamadeh, N., Rissanen, M., & Yamanaka, M. (2013). *Crowd-sourced price data collection through mobile phones* [Paper presentation]. NTTS 2013 Conference, Brussels, Belgium. Retrieved from https://datasearch.gesis.org/detail?q=api_worldbank_org_v2_datacatalog-105

Havrylyshyn, O., & Tarr, D. G. (1991). *Trade liberalization and the transition to a market economy* (World Bank Discussion Paper No. 137). World Bank. Retrieved from https://ideas.repec.org/p/wbk/wbrwps/700.html

Holsti, O. R. (1969). *Content analysis for the social sciences and humanities*. Addison-Wesley. Retrieved from https://books.google.ro/books/about/Content_Analysis_for_the_Social_Sciences.html?hl=id&id=IMpCAAAAIAAJ&redir_esc=y

IFAD. (2001). *Rural poverty report 2001: The challenge of ending rural poverty*. Oxford University Press.

Inter-réseaux. (2008). *Market information systems (MIS): Effective systems for better transparency of markets?* Retrieved from http://www.inter-reseaux.org/IMG/pdf_SIM_engl.pdf

Islam, M. S., & Grönlund, A. (2010). Agriculture Market Information Services (AMIS) in the Least Developed Countries (LDCs): Nature, Scopes, and Challenges. In M. A. Wimmer *et al.* (Eds.), *Electronic Government* (pp. 109–120). https://doi.org/10.1007/978-3-642-14799-9_10?urlappend=%3Futm_source%3Dresearchgate.net%26utm_medium%3Darticle

Jacobs, C. (1981). *Cooperatives and development: The case of small farmer marketing in Murang'a District, Kenya* (Publication No. 1981-00591) [Master's thesis, Carleton University]. NSAL. https://doi.org/10.22215/etd/1981-00591

Jadhav, A., Nkonu, M., & Clause, V. (2013). *Mobile market information for agri VAS operators: A quick start guide*. GSMA. Retrieved from https://www.gsma.com/solutions-and-impact/connectivity-for-good/mobile-for-

development/gsma_resources/mobile-market-information-for-agri-vas-operators-a-quick-start-guide/

Jaffee, S. (1994). *Private trader response to market liberalization in Tanzania's cashew nut industry* (World Bank Policy Research Working Paper No. 1277). World Bank. Retrieved from https://www.researchgate.net/publication/23721701_Private_trader_response_to_market_liberalization_in_Tanzania's_cashew_nut_industry

Jayne, T. S., *et al.* (1996). *Trends in real food prices in six sub-Saharan African countries* (Policy Synthesis No. 2). USAID. Retrieved from https://pdf.usaid.gov/pdf_docs/pnaby172.pdf

Jensen, R. (2007). The digital provide: Information (technology), market performance, and welfare in the South Indian fisheries sector. *The Quarterly Journal of Economics*, *122*(3), 879–924. Retrieved from https://www.jstor.org/stable/25098864

Jones, S., & Beynon, J. (1992). *Market liberalization and private sector responses in Eastern and Southern Africa*. Food Studies Group, Oxford University.

Karen, R. (1985). Adams International: Tobacco growing and marketing in northern Thailand. In R. Karen (Ed.), *Agribusiness and the Small-Scale Farmer* (pp. 173–188). Routledge. https://doi.org/10.4324/9780429035814-11

Karuga, J. (2016). Online platforms enhance regional grain trade. *Spore*, (181), 34–35.

Katengeza, S. P. (2012). ICT-based market information services, operational environment and performance: The case of Malawi Agricultural Commodity Exchange. *American International Journal of Social Science*, *1*(2), 34–43.

Kato, E., & Nkonya, E. (2005). Information asymmetry among output traders, processors and farmers in Uganda. In *Improving information flows to the rural community* (pp. 29–33). FAO. Retrieved from https://cgspace.cgiar.org/items/13f79404-7fdf-4d8d-be34-cb7667decd6b

Kherallah, M., Delgado, C., Gabre-Madhin, E., Minot, N., & Johnson, M. (2002). *The road half-traveled: Agricultural market reform in sub-Saharan Africa*. International Food Policy Research Institute. Retrieved from https://www.academia.edu/29613009/The_road_half_traveled

Kizito, A. M. (2011). *The structure, conduct, and performance of agricultural market information systems in sub-Saharan Africa* [Doctoral dissertation, Michigan State University]. MSU Libraries. Retrieved from https://www.researchgate.net/publication/228893245_THE_STRUCTURE_CONDUCT_AND_PERFORMANCE_OF_AGRICULTURAL_MARKET_INFORMATION_SYSTEMS_IN_SUB-SAHARAN_AFRICA

Kpenavoun Chogou, S., Gandonou, E., & Adegbidi, A. (2009). *Impact of public market information system (PMIS) on farmers' food marketing decisions: Case of Benin* [Paper presentation]. 111th EAAE-IAEE Seminar, Canterbury, UK. https://doi.org/10.22004/ag.econ.52999

Labonne, J., & Chase, R. S. (2009). *The power of information: The impact of mobile phones on farmers' welfare in the Philippines* (Policy Research Working Paper No. 4996). World

Bank. Retrieved from https://openknowledge.worldbank.org/server/api/core/bitstreams/2ac1687b-9ebb-500f-8dc7-29d4d815bf11/content

Lutz, C., van Tilburg, A., & Shepherd, A. W. (1997). The theory. In A. W. Shepherd (Ed.), *Market information services: Theory and practice* (AGS Bulletin No. 125). Food and Agriculture Organization of the United Nations. Retrieved from https://openknowledge.fao.org/server/api/core/bitstreams/80f10d95-4edf-4e88-93a4-28c6c8541714/content

Mabota, A., Arlindo, P., Paulo, A., & Donovan, C. (2003). *Market information: A low cost tool for agricultural market development?* (Flash Series No. 37E). MADER-Directorate of Economics, Mozambique. Retrieved from https://www.researchgate.net/publication/5180023_Market_Information_A_Low_Cost_Tool_for_Agricultural_Market_Development

Macbailey, F. (1983). *The social and cultural factors involved in production by small farmers in Cameroun of plantain and cassava and their marketing* (RRD 21). UNESCO. *(Note: Originally published in 1983 as part of UNESCO's Reports and Studies; 2017 is likely a digital reprint date).*

Mawazo, M. M., Michael, K., & Ko, J. (2014). Agricultural market information services in developing countries: A review. *ACSIJ Advances in Computer Science: An International Journal*, *3*(9), 38–47.

Mawere, J. (2008). *Agricultural marketing information and maize marketing in Zambia: A survey of Kabwe District in the Central Province of Zambia* [Unpublished MBA thesis]. The Copperbelt University.

Maynard, H. H., & Beckman, T. N. (1952). *Principles of marketing* (5th ed.). Ronald Press Company. *(Note: This is a foundational marketing text; your 2018 date likely refers to a modern reprint of this classic).* Retrieved from https://books.google.ro/books/about/Principles_of_Marketing.html?id=jGI9vwEACAAJ&redir_esc=y

Mendoza, G. (2006). *Evaluation study of "best practices" in agricultural marketing information systems (AMIS)*. Market Information Organization of the Americas (MIOA).

Moore, J. R., Johl, S. S., & Khusro, A. M. (1973). *Indian foodgrain marketing*. Prentice-Hall of India. Retrieved from https://www.abebooks.com/signed-first-edition/Indian-Foodgrain-Marketing-Moore-John-Runyan/556078732/bd

Morocchino, A. (2008). *A guide to upgrading rural agricultural retail markets*. Food and Agriculture Organization of the United Nations. Retrieved from https://www.fao.org/4/ap295e/ap295e.pdf

Moustier, P., Nguyen, T. T. L., & Hoang, B. G. (2014). Operation and results of a vegetable market information and consultation system in Vietnam. *Cahiers Agricultures*, *23*(4-5), 304–309. Retrieved from https://www.cahiersagricultures.fr/articles/cagri/pdf/2014/04/cagri2014234-5p304.pdf

Mukhebi, A. (2004). *Reaching the poor in rural Kenya with market information: A case study of a market information system* [Paper presentation]. CTA Seminar, Maputo, Mozambique. Retrieved from https://scholar.google.com/citations?view_op=view_citation&hl=en&user=AYVRpdsAAAAJ&citation_for_view=AYVRpdsAAAAJ:8k81kl-MbHgC

Mukhebi, A., & Kundu, J. (2014). Linking farmers to markets in Kenya: The evolving KACE model. *Cahiers Agricultures*, *23*(4-5), 282–287. Retrieved from https://doi.org/10.1684/agr.2014.0710

Muto, M., & Yamano, T. (2009). The impact of mobile phone coverage expansion on market participation: Panel data evidence from Uganda. *World Development*, *37*(12), 1887–1896. Retrieved from https://doi.org/10.1016/j.worlddev.2009.05.004

Mwanga, C. (2008). *An evaluation of losses in maize marketing: A case study of Mporokoso District* [Unpublished dissertation]. University of Zambia.

Nakasone, E. (2013). *The role of price information in agricultural markets: Experimental evidence from rural Peru* [Paper presentation]. AAEA & CAES Joint Annual Meeting, Washington, DC. https://www.researchgate.net/publication/259043871_The_Role_of_Price_Information_in_Agricultural_Markets_Experimental_Evidence_from_Rural_Peru

Neuendorf, K. A. (2002). *The content analysis guidebook*. Sage Publications. Retrieved from https://methods.sagepub.com/book/mono/the-content-analysis-guidebook-2e/toc#_

Ngombalu, J., & Masila, G. (2014). Enhancing intra-regional grain trade in Eastern Africa through market information systems: The case of the Regional Agricultural Trade Intelligence Network (RATIN). *Cahiers Agricultures*, *23*(4-5), 288–296. Retrieved from https://www.cahiersagricultures.fr/articles/cagri/pdf/2014/04/cagri2014234-5p270.pdf

Ogutu, S. O., Okello, J. J., & Otieno, D. J. (2014). Impact of information and communication technology-based market information services on smallholder farm input use and productivity: The case of Kenya. *World Development*, *64*, 311–321. https://doi.org/10.1016/j.worlddev.2014.06.011

Osterwalder, A., & Pigneur, Y. (2010). *Business model generation: A handbook for visionaries, game changers, and challengers*. John Wiley & Sons. Retrieved from https://www.researchgate.net/publication/236650466_Business_Model_Generation_A_Handbook_for_Visionaries_Game_Changers_and_Challengers

Pender, J., & Alemu, D. (2007). *Determinants of smallholder commercialization of food crops: Theory and evidence from Ethiopia* (IFPRI Discussion Paper No. 745). International Food Policy Research Institute. Retrieved from https://www.researchgate.net/publication/5056674_Determinants_of_smallholder_commercialization_of_food_crops_Theory_and_evidence_from_Ethiopia

Pender, J., Place, F., & Ehui, S. (2006). Conceptual framework and hypotheses. In J. Pender, F. Place, & S. Ehui (Eds.), *Strategies for sustainable land management in the*

East African Highlands (pp. 31–58). International Food Policy Research Institute & World Bank. Retrieved from https://www.cifor-icraf.org/publications/downloads/Publications/PDFS/BC06273.pdf

Peters, P. E. (1996). *Agricultural commercialization, rural economy and household livelihoods in Malawi*. Harvard Institute for International Development (HIID).

Pingali, P. L., & Rosegrant, M. W. (1995). Agricultural commercialization and diversification: Processes and policies. *Food Policy*, *20*(3), 171–185. https://doi.org/10.1016/0306-9192(95)00012-4

Pirttilä, J. (2023, February 1). *Direct support to small scale farmers reduces poverty – what Zambia is doing right*. The Conversation. Retrieved from https://theconversation.com/direct-support-to-small-scale-farmers-reduces-poverty-what-zambia-is-doing-right-196054

Poon, B. (2001). *Guide to the establishment of market information services*. Retrieved from https://openknowledge.fao.org/bitstreams/80f10d95-4edf-4e88-93a4-28c6c8541714/download

Qiang, C. Z., Kuek, S. C., Dymond, A., & Esselaar, S. (2012). *Mobile applications for agricultural and rural development*. World Bank. Retrieved from https://openknowledge.worldbank.org/entities/publication/b6b85d4c-f1c8-5da2-bc76-60659b843ba1

Reardon, T., Chen, K. Z., Minten, B., & Adriano, L. (2012). *The quiet revolution in staple food value chains: Enter the dragon, the elephant, and the tiger*. Asian Development Bank & International Food Policy Research Institute. Retrieved from https://www.adb.org/sites/default/files/publication/30063/quiet-revolution-staple-food-value-chains.pdf

Reardon, T., Timmer, C. P., Barrett, C. B., & Berdegué, J. (2003). The rise of supermarkets in Africa, Asia, and Latin America. *American Journal of Agricultural Economics*, *85*(5), 1140–1146. https://doi.org/10.1111/j.0092-5853.2003.00520.x

Robbins, P. (2000). *Review of market information systems in Botswana, Ethiopia, Ghana and Zimbabwe*. Technical Centre for Agricultural and Rural Cooperation (CTA). Retrieved from https://cgspace.cgiar.org/server/api/core/bitstreams/bfb6f3ba-a6e5-41c1-bd09-309ef6803d4e/content

Rowan-Campbell, D., & Tandon, N. (2009). More than market info. *ICT Update*, (47).

Schubert, B., Zehrfeld, E. H., & Juntermans, G. (1988). *Agricultural market information services: Guidelines for the design and management of market information projects*. GTZ (German Agency for Technical Cooperation)

Sharma, A. (2010). *Crowdsourcing critical success factor model* (Working Paper No. 1-2010). London School of Economics and Political Science (LSE). https://irevolutions.org/wp-content/uploads/2010/05/working-paper1.pdf

Shepherd, A. W. (1997). *Market information services: Theory and practice* (AGS Bulletin No. 125). Food and Agriculture Organization of the United Nations. Retrieved from https://openknowledge.fao.org/server/api/core/bitstreams/80f10d95-4edf-4e88-93a4-28c6c8541714/content

Shepherd, A. W. (2001, February 19–22). *Farm radio as a medium for market information dissemination* [Paper presentation]. First International Workshop on Farm Radio Broadcasting, Rome, Italy. Retrieved from https://www.fao.org/4/x6721e/x6721e22.htm

Shepherd, A. W. (2005). Bringing market information to farmers: Opportunities through FM radio. In *Improving information flows to the rural community* (Occasional Paper No. 9, pp. 35–43). Food and Agriculture Organization of the United Nations.

Shepherd, A. W. (2007). *Approaches to linking producers to markets* (Agricultural Management, Marketing and Finance Occasional Paper No. 13). Food and Agriculture Organization of the United Nations. Retrieved from https://openknowledge.fao.org/server/api/core/bitstreams/3c8d3a02-4425-418a-8520-bcb7a1c70d5c/content

Shepherd, A. W. (2011). *Understanding and using market information* (Marketing Extension Guide No. 2). Food and Agriculture Organization of the United Nations. Retrieved from https://openknowledge.fao.org/server/api/core/bitstreams/b2cc1bd7-f762-431b-8322-ee319d61b591/content

Shepherd, A. W., & Schalke, A. J. F. (1995). *An assessment of the Indonesian horticultural market information service* (AGSM Occasional Paper No. 8). Food and Agriculture Organization of the United Nations. Retrieved from https://www.fao.org/fileadmin/user_upload/ags/publications/INDONMIS.pdf

Shilpi, F., & Umali-Deininger, D. (2008). Market facilities and agricultural marketing: Evidence from Tamil Nadu, India. *Agricultural Economics*, *39*(3), 281–294. Retrieved from https://doi.org/10.1111/j.1574-0862.2008.00333.x

Simukanga, A., Phiri, J., Nyirenda, M., & Kalumbilo-Kabemba, M. (2018). E-governance systems: A case study of the development of a small-scale farmer database. *Zambia ICT Journal*, *2*(1), 7–15. https://doi.org/10.33260/zictjournal.v2i1.41

Singhal, A. K. (1999). *Agricultural marketing in India*. Anmol Publications. Retrieved from https://books.google.ro/books/about/Agricultural_Marketing_in_India.html?id=hpwwAAAAMAAJ&redir_esc=y

Slavova, M. (2009). Encouraging foreign exchange. *ICT Update*, (47), 12–13.

Staatz, J. M. (2011). *Evaluating the impact on market performance of investments in market information systems: Methodological challenges* (Staff Paper No. 2011-01). Michigan State University. Retrieved from https://ageconsearch.umn.edu/record/108184/

Staatz, J. M., Kizito, A., Weber, M. T., & Dembélé, N. N. (2014). Challenges in measuring the impact of market information systems. *Cahiers Agricultures*, *23*(4-5), 317–324. Retrieved from https://www.cahiersagricultures.fr/articles/cagri/pdf/2014/04/cagri2014234-5p317.pdf

Svensson, J., & Yanagizawa, D. (2009). Getting prices right: The impact of the market information service in Uganda. *Journal of the European Economic Association*, *7*(2-3), 435–445. Retrieved from https://yanagizawadrott.com/wp-content/uploads/2016/02/getting-prices-right.pdf

Tollens, E. F. (2006, August 12–18). *Market information systems in sub-Sahara Africa, challenges and opportunities* [Paper presentation]. International Association of Agricultural Economists Conference, Gold Coast, Australia. Retrieved from https://www.researchgate.net/publication/23511667_Market_Information_Systems_in_Sub-Sahara_Africa_Challenges_and_Opportunities

Tollens, E. F. (2006a). *Manual on cocoa market information systems based on experiences in Nigeria, Cameroon and Côte d'Ivoire* (Working Paper No. 2006/94). Katholieke Universiteit Leuven. Retrieved from https://www.researchgate.net/publication/23511667_Market_Information_Systems_in_Sub-Sahara_Africa_Challenges_and_Opportunities

Tracey-White, J. (2003). *Planning and designing rural markets* (Marketing Extension Guide No. 4). Food and Agriculture Organization of the United Nations. Retrieved from https://openknowledge.fao.org/server/api/core/bitstreams/a67385ca-c386-4392-b9e3-e8fdb7a9ae1c/content

Van der Geest, K. (2010). *Rural youth employment in developing countries: A global view* (Rural Employment Overview No. 1). FAO. Retrieved from https://www.fao.org/4/al414e/al414e00.pdf

Weber, M. T., Donovan, C., Staatz, J. M., & Dembélé, N. N. (2005). *Guidelines for building sustainable market information systems in Africa with strong public-private partnerships* (Policy Synthesis No. 78). Michigan State University. Retrieved from https://www.researchgate.net/publication/5180515_Guidelines_for_Building_Sustainable_Market_Information_Systems_in_Africa_with_Strong_Public-Private_Partnerships

World Bank. (2005). *Managing food price risks and instability in an environment of market liberalization* (Report No. 32727-GLB). World Bank. https://doi.org/10.1596/8264

World Bank. (2011). *ICT in agriculture: Connecting smallholders to knowledge, networks, and institutions* (e-Sourcebook). Retrieved from https://openknowledge.worldbank.org/entities/publication/20e761ff-89c1-56b2-8302-be059076a909

Zoltner, J., & Steffen, M. (2012). *An assessment of market information systems in East Africa* (USAID Briefing Paper). Fintrac Inc. Retrieved from https://www.ictworks.org/wp-content/uploads/2013/05/An_Assessment_of_Market_Information_Systems_in_East_Africa.pdf

Zulu, B., Jayne, T. S., & Beaver, M. (2006). *Is the glass half-empty or half full? An analysis of agricultural production trends in Zambia* (Working Paper No. 22). Food Security Research Project. Retrieved from https://www.researchgate.net/publication/5180050_Is_the_Glas_Half-Empty_or_Half_Full_An_Analysis_of_Agricultural_Production_Trends_in_Zambia