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THE INFLUENCE OF MOBILE TECHNOLOGY ON ACCESS TO MARKET INFORMATION FOR DECISION-MAKING AMONG AVOCADO SMALLHOLDER FARMERS IN RUNGWE DISTRICT COUNCIL, TANZANIA

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ABSTRACT

Access to timely market information is essential for improving marketing decisions among smallholder farmers. However, many avocado farmers in Tanzania continue to face challenges in obtaining reliable market information, limiting their ability to identify profitable markets and negotiate favourable prices. This study investigated the influence of mobile technology on access to market information for decision-making among avocado smallholder farmers in Rungwe District Council, Tanzania. A mixed-methods approach employing a cross-sectional research design was adopted. Quantitative data were collected from 46 randomly selected avocado smallholder farmers using structured questionnaires, while qualitative data were obtained through key informant interviews and focus group discussions. Quantitative data were analysed using descriptive statistics in SPSS version 29.2, whereas qualitative data were analysed using thematic analysis. The findings revealed that 54.3% of the respondents reported that mobile technology enabled them to access timely market information, facilitating price comparison, identification of potential buyers and informed marketing decisions. Nevertheless, high internet data costs (47.6%), poor mobile network connectivity (28.6%) and delayed information updates (23.8%) remained significant barriers to effective utilization of mobile technology. The study concludes that mobile technology plays a significant role in improving access to market information for decision-making among avocado smallholder farmers, although its effectiveness is constrained by digital infrastructure and affordability challenges. The study recommends strengthening rural mobile network infrastructure, reducing internet costs and promoting digital literacy programmes to

enhance farmers' effective use of mobile technology for market information and decision-making.

KEYWORDS: Mobile technology, market information, decision-making, avocado smallholder farmers, Rungwe District Council, Tanzania.

INTRODUCTION

Agriculture is a major source of livelihood for smallholder farmers worldwide, but limited access to reliable market information constrains informed marketing decisions. Mobile technology has emerged as an important digital tool that provides farmers with timely market information, strengthens market participation and improves agricultural productivity. Consequently, it is increasingly recognized as a key driver of sustainable rural development (FAO, 2022; ITU, 2023; World Bank, 2024).

Mobile technology has transformed agricultural decision-making by enabling farmers to access real-time market prices, communicate directly with buyers and compare market opportunities through digital platforms. These services reduce information asymmetry, lower transaction costs and improve farmers' bargaining power. As a result, mobile technology has become an essential decision-support tool in modern agricultural marketing (Aker et al., 2021; FAO, 2022; World Bank, 2024).

Across Africa, mobile technology has significantly improved farmers' access to agricultural information, market prices and extension services, enhancing their participation in agricultural markets. However, challenges such as limited digital literacy, poor internet connectivity and high service costs continue to constrain effective utilization among many rural farmers. Despite these limitations, mobile technology remains central to Africa's agricultural transformation (Rahman et al., 2020; Do et al., 2023; GSMA, 2024).

In Tanzania, government initiatives and expanding mobile phone ownership have increased opportunities for smallholder farmers to access digital agricultural services and market information. Nevertheless, many farmers still face difficulties in effectively using available market information to support marketing decisions. This suggests that greater attention should be given to understanding how mobile technology influences market information use rather than merely technology ownership (FAO, 2022; TCRA, 2024; United Republic of Tanzania, 2023).

Avocado production has become an important source of income for smallholder farmers in Rungwe District Council, yet many producers continue to experience marketing challenges

resulting from limited access to reliable market information. Dependence on brokers, fluctuating prices and weak bargaining power often affect farmers' marketing decisions. Mobile technology has the potential to address these challenges by facilitating timely access to market information and direct communication with buyers (Mlay et al., 2019; Krell et al., 2021; TNBS, 2023).

Although previous studies have examined mobile technology adoption in agriculture, limited research has specifically investigated its influence on access to market information for decision-making among avocado smallholder farmers. Existing evidence has focused mainly on staple crops and general technology adoption, leaving a knowledge gap within Tanzania's avocado value chain. Addressing this gap is essential for designing digital interventions that improve market-oriented decision-making among farmers (Aker et al., 2021; Do et al., 2023; World Bank, 2024).

This study therefore investigates the influence of mobile technology on access to market information for decision-making among avocado smallholder farmers in Rungwe District Council, Tanzania. The study seeks to generate empirical evidence on how mobile technology supports informed marketing decisions and contributes to improving farmers' participation in agricultural markets. The findings are expected to inform policymakers, extension services and digital service providers in strengthening technology-based agricultural information systems.

2. LITERATURE REVIEW

2.1 Agricultural Modernization Theory

The **Agricultural Modernization Theory**, advanced by Theodore W. Schultz (1964) and Bruce F. Johnston and John W. Mellor (1961), explains that agricultural development is achieved through the adoption of modern technologies that improve productivity, market integration and decision-making. The theory is relevant to this study because it views mobile technology as a transformative innovation that enables avocado smallholder farmers to access timely market information, identify market opportunities and make informed marketing decisions. By reducing information asymmetry and transaction costs, mobile technology strengthens farmers' participation in competitive markets and supports evidence-based decision-making, making the theory an appropriate framework for examining the influence of mobile technology on access to market information among avocado smallholder farmers.

2.2 Empirical Literature Review

Empirical evidence consistently demonstrates that mobile technology has significantly improved farmers' access to market information, thereby enhancing agricultural decision-making across developing countries. Mobile phones facilitate timely access to information on market prices, buyer demand, product quality requirements and selling opportunities, enabling farmers to determine when, where and to whom to sell their produce. In Tanzania, Kosec et al. (2016) found that farmers who used mobile phones accessed market price information more quickly than those relying on traditional communication channels, enabling them to compare prices across different markets and reduce dependence on local traders. Similarly, Aker (2020) reported that mobile technology reduced information asymmetry among smallholder farmers by providing real-time market information, thereby improving marketing decisions and reducing reliance on intermediaries. These findings indicate that timely access to reliable market information enhances farmers' capacity to make informed marketing decisions, improves bargaining power and reduces market inefficiencies (Aker, 2020; Kosec et al., 2016).

Similar evidence has been reported across other African countries, where mobile technology has strengthened farmers' decision-making by improving access to agricultural information. Suri and Jack (2016) observed that farmers in Kenya using mobile phones received market information substantially faster than those relying on conventional information sources, enabling them to identify profitable markets and strategically plan the timing of sales. Likewise, Aker and Mbiti (2020) argued that mobile technology enhances access to diverse market information through internet-based platforms, mobile applications and digital communication, allowing farmers to respond more effectively to changing market conditions. However, they also noted that the effectiveness of mobile technology depends on several contextual factors, including digital literacy, smartphone ownership, affordability of internet services and reliable mobile network infrastructure, particularly in rural communities (Aker & Mbiti, 2020; Suri & Jack, 2016).

Although these studies collectively demonstrate the positive influence of mobile technology on agricultural marketing, their findings differ across countries because of variations in socioeconomic conditions, institutional support, digital infrastructure, mobile network coverage and farmers' technological capabilities. For example, Kenya has experienced rapid expansion of digital financial services and mobile-based agricultural platforms, creating an enabling environment for farmers to access market information and engage directly with buyers. In contrast, countries such as Tanzania and Uganda continue to face relatively lower

levels of digital inclusion in many rural areas, characterised by inadequate internet connectivity, limited smartphone ownership and high mobile data costs. Similarly, evidence from Niger highlights the importance of donor-supported digital interventions and local institutional arrangements that may not be directly comparable to the Tanzanian agricultural context. These contextual differences suggest that the effectiveness of mobile technology is influenced not only by technology availability but also by the broader economic, policy and infrastructural environment within which farmers operate (Aker, 2020; GSMA, 2024; World Bank, 2024).

Consequently, the findings reported in Kenya, Niger and Uganda cannot be directly generalised to Tanzania without empirical validation. Agricultural production systems, market structures, value chains, government digital policies and levels of technological adoption differ considerably across African countries. Furthermore, avocado production represents a specialised, high-value horticultural enterprise characterised by fluctuating market prices, strict quality standards, perishability and strong export market orientation. These characteristics create information needs that differ substantially from those associated with staple crops such as maize, rice and cassava, which have been the primary focus of many previous studies. Therefore, evidence generated from other countries or different agricultural commodities may not adequately explain how mobile technology influences market information access and decision-making among avocado smallholder farmers in Tanzania (Food and Agriculture Organization[FAO], 2022; Tanzania National Bureau of Statistics [TNBS], 2023; World Bank, 2024).

In addition, several methodological limitations remain evident within the existing literature. Most previous studies have concentrated on measuring the adoption or ownership of mobile phones rather than examining how farmers actually utilise mobile technology to obtain market information for decision-making. Many studies have employed purely quantitative approaches, limiting their ability to explain farmers' experiences, perceptions and behavioural responses regarding digital information use. Others have focused on national or regional analyses without providing context-specific evidence from individual districts where market conditions, infrastructure and agricultural practices differ substantially. Consequently, there remains limited understanding of the mechanisms through which mobile technology influences market information access within specific horticultural value chains and local institutional environments (Creswell & Creswell, 2023; Aker & Mbiti, 2020).

Despite the growing body of evidence demonstrating the benefits of mobile technology, limited empirical research has specifically examined its influence on access to market

information for decision-making among avocado smallholder farmers in Tanzania. Most previous studies have focused on staple crops or general agricultural technology adoption without considering the unique marketing characteristics of high-value horticultural crops such as avocado. Moreover, little empirical evidence exists from Rungwe District Council, where avocado farmers continue to experience challenges in accessing timely and reliable market information. By employing a mixed-methods approach that integrates quantitative evidence with qualitative insights from farmers, extension officers and other key stakeholders, this study provides context-specific empirical evidence on how mobile technology influences market information access and marketing decision-making among avocado smallholder farmers. The study therefore contributes new knowledge by addressing an important geographical, commodity-specific and methodological gap in the literature, while generating evidence that can inform policies and digital interventions aimed at strengthening agricultural market information systems in Tanzania and comparable developing-country contexts (FAO, 2022; World Bank, 2024; United Republic of Tanzania, 2023).

3. RESEARCH METHODOLOGY

This study employed a mixed-methods approach using a cross-sectional research design to investigate the influence of mobile technology on access to market information for decision-making among avocado smallholder farmers in Rungwe District Council, Tanzania. Quantitative data were collected from 46 randomly selected avocado smallholder farmers using structured questionnaires, while qualitative data were obtained through key informant interviews and focus group discussions involving agricultural extension officers, market officers, farmer cooperative representatives and selected farmers. Quantitative data were analyzed using descriptive statistics in SPSS version 29.2, whereas qualitative data were analyzed using thematic analysis to identify recurring themes related to mobile technology and market information. The mixed-methods approach enabled triangulation of findings, thereby enhancing the credibility and comprehensiveness of the study.

4. FINDINGS AND DISCUSSION

4.1 Influence of Mobile Technology on Access to Market Information for Decision-Making

The study examined whether mobile technology enabled avocado smallholder farmers to access timely market information for decision-making. The findings revealed that **54.3% (n**

= 25) of the respondents reported that mobile technology enabled them to receive market information on time, whereas 45.7% (n = 21) indicated that they did not receive timely market information through mobile technology. Among respondents who experienced challenges, 47.6% attributed the problem to high internet data costs, 28.6% to poor mobile network connectivity and 23.8% to delayed information updates. These findings suggest that although mobile technology has improved access to market information for many farmers, infrastructural and financial constraints continue to limit its effectiveness for a considerable proportion of users.

Table 1: Influence of mobile technology toward timely market information access. (n=46)

Parameters	Frequency	Percent
Mobile technology helps receive market information on time		
Yes	25	54.3
No	21	45.7
Total	46	100
Reasons for not receiving market information on time		
Poor mobile network connectivity	6	28.6
Delayed updates	5	23.8
High internet data costs	10	47.6
Total	21	100

Source: Field data, 2025.

The findings further indicate that farmers who accessed timely market information through mobile technology were able to compare prices from different markets, identify potential buyers and determine appropriate marketing strategies before selling their avocados. During interviews, an Agricultural Extension Officer explained that mobile applications such as **e-Soko** and **M-Kilimo** enable farmers to obtain real-time price information from multiple markets, helping them identify favourable selling opportunities and reduce dependence on middlemen. Similarly, participants in the focus group discussions reported that access to current market information allowed them to choose markets offering better prices and make more informed marketing decisions.

One participant from Nkunga Ward stated:

"With e-Soko and M-Kilimo, we know the prices from several buyers. If a local trader offers a low price, we can transport our avocados to Mbeya town or another market with better rates. This helps us avoid middlemen and sell at a fair price." (FGD participant, Nkunga Ward).

This quotation demonstrates that mobile technology extends beyond improving access to market information by directly influencing marketing decision-making. Access to real-time price information enabled farmers to evaluate alternative markets, compare buyer offers and select marketing options that were considered more beneficial. This suggests that mobile technology functions as a practical decision-support tool that enhances farmers' ability to make informed marketing decisions.

The findings are consistent with Mwakaje (2015), who found that mobile phones improve access to market information and facilitate communication between farmers and buyers. Similarly, Kosec et al. (2016) observed that timely access to market prices enabled Tanzanian farmers to compare alternative markets before selling agricultural produce. The present study extends these findings by demonstrating that among avocado smallholder farmers, access to market information influences practical marketing decisions, including buyer selection, market choice and the timing of product sales. However, the study also confirms the observations of Okyere and Mekonnen (2012) that infrastructural challenges such as poor network coverage and high internet costs continue to limit farmers' effective utilization of mobile technology.

5. CONCLUSION

This study investigated the influence of mobile technology on access to market information for decision-making among avocado smallholder farmers in Rungwe District Council, Tanzania. The findings demonstrate that mobile technology has become an important tool for improving farmers' access to timely market information, enabling them to compare prices across different markets, identify potential buyers and make informed marketing decisions. Through mobile phones and agricultural applications such as *e-Soko* and *M-Kilimo*, farmers were able to obtain real-time market information that supported decisions on when, where and to whom to sell their avocados. Improved access to market information also reduced information asymmetry between farmers and buyers, thereby strengthening farmers' ability to negotiate market prices and select more profitable marketing opportunities. Nevertheless, the study established that the benefits of mobile technology were constrained by several challenges, including high internet data costs, poor mobile network connectivity and delays in receiving market information. These barriers limited the effective utilization of mobile technology among some farmers, indicating that improved digital infrastructure and enhanced digital capacity are essential for maximizing the contribution of mobile technology to market information access and informed decision-making among avocado smallholder farmers.

5.1 RECOMMENDATION

Based on these findings, the study recommends that the Government of Tanzania, local government authorities, agricultural extension services, telecommunication companies and agricultural development partners collaborate to strengthen digital agricultural information systems for avocado smallholder farmers. Particular attention should be given to expanding reliable mobile network coverage in rural areas, reducing the cost of internet services and supporting the development of affordable, user-friendly agricultural mobile platforms that provide accurate and timely market information. In addition, regular digital literacy programmes should be implemented to enhance farmers' capacity to effectively use mobile technologies for accessing market information and making informed marketing decisions. Strengthening these interventions will improve farmers' ability to respond to changing market conditions, enhance the quality of marketing decisions and promote more efficient participation in avocado markets within Rungwe District Council and other horticultural-producing areas in Tanzania.

REFERENCES

1. Aker, J. C. (2020). *Using mobile phones to improve market outcomes: Evidence from a randomized experiment in Niger*. *American Economic Journal: Applied Economics*, 12(4), 187–218.
2. Aker, J. C., & Mbiti, I. M. (2020). Mobile phones and economic development in Africa. *Journal of Economic Perspectives*, 24(3), 207–232.
3. Creswell, J. W., & Creswell, J. D. (2023). *Research design: Qualitative, quantitative, and mixed methods approaches* (6th ed.). SAGE Publications.
4. Food and Agriculture Organization. (2022). *FAOSTAT: Avocado production statistics 2022*.
5. GSMA. (2024). *The State of Mobile Internet Connectivity Report 2024*. GSMA. <https://www.gsma.com/r/somic/>
6. International Telecommunication Union. (2023). *Measuring digital development: Facts and figures 2023*. ITU. <https://www.itu.int/>
7. Johnston, B. F., & Mellor, J. W. (1961). *The role of agriculture in economic development*. *American Economic Review*, 51(4), 566–593.
8. Kosec, K., Muller, M., & Savchenko, Y. (2016). Mobile phones and farmers' access to markets: Evidence from Tanzania. *Food Policy*, 65, 24–35.

9. Krell, N. T., Giroux, S. A., Guido, Z., Hannah, C., Lopus, S. E., Caylor, K. K., & Evans, T. P. (2021). Smallholder farmers' use of mobile phone services in agriculture: A systematic review. *Journal of Rural Studies*, 81, 102–112.
10. Masuki, K. F. G., Kamugisha, R., Mowo, J. G., Tanui, J., Tukahirwa, J., & Mogoi, J. (2010). *Role of mobile phones in improving communication and information delivery for agricultural development: Lessons from South Western Uganda*. ICRAF.
11. Mlay, G., Mwakatundu, N., & Komba, D. (2019). The role of avocado farming in poverty alleviation in Tanzania. *Journal of Agribusiness and Rural Development*, 7(3), 45–59.
12. Mwakaje, A. G. (2015). Information and communication technology for rural farmers' market access in Tanzania. *Journal of Agricultural Informatics*, 6(2), 1–14.
13. Okyere, K. A., & Mekonnen, D. A. (2012). The importance of ICTs in agricultural market information systems: Evidence from smallholder farmers in Africa. *African Journal of Agricultural Research*, 7(45), 6120–6128.
14. Schultz, T. W. (1964). *Transforming traditional agriculture*. Yale University Press.
15. Suri, T., & Jack, W. (2016). The long-run poverty and gender impacts of mobile money. *Science*, 354(6317), 1288–1292.
16. Tanzania Communications Regulatory Authority. (2024). *Quarterly communications statistics report*. Dodoma, Tanzania.
17. Tanzania National Bureau of Statistics. (2023). *Agricultural production report 2022/2023*. Government of Tanzania.
18. United Republic of Tanzania. (2023). *Agricultural sector development programme annual report*. Ministry of Agriculture.
19. World Bank. (2024). *Digital technologies for agricultural transformation*. World Bank.