Texila International Journal of Management
ISSN: 2520-310X
DOI: 10.21522/TIJMG.2015.06.02.Art012

Leveraging information Communication Technology for Crop Marketing in Northern Province of Zambia

Article by John Phiri[1], Madhu Bala[2]
[1]PhD, Management, Zambia
[2]PhD, Assistant Professor, Department of Commerce, D.A.V. College for Girls, India
E-mail: johnphiri7@yahoo.com[1], dearmadhubala@gmail.com[2]

Abstract

The article focuses on leveraging Information Communication Technology (ICT) for crop marketing in the Northern Province of Zambia. Government's investment in the use of ICT is often inspired by its potential to realise benefits in trade innovations. Recent developments in the field of global information flow have led to a renewed interest in the study of ICT. However, few writers have been able to draw on any systematic research into how ICT is leveraged particularly for crop marketing in Northern Province of Zambia. Both primary and secondary data were collected. The total sample size was 290 while total population was 7,840, for the three districts and six camps under study.

The findings revealed that there are various challenges that stand as impediments towards successful reaping of the fruits of ICT in crop marketing. Some of these include high cost of units and bundles which usually expire when not utilised within a specified period of time, lack of electricity and frequent power outages. Subsequently, the study concludes that most of the farmers and crop traders lacked awareness of various ICT applications accessible through mobile phones or internet such as Zoom, Face Book and WhatsApp including their potential contribution to crop marketing. The study recommends the need to build crop marketing capabilities by training farmers, traders and agricultural extension workers in ICT usage for them to tap into opportunities found therein and as a necessary strategy for expansion of crop marketing in Zambia.

Keywords: *Information Communication Technology, ICT, Crop Marketing.*

Introduction

The article examines leveraging Information Communication Technology (ICT) for crop marketing in Northern Province of Zambia. In the new global economy, ICT has become a central issue for marketing. Business entities are now expected to create enabling environment where information is passed on to consumers by facilitating access to market so that their own clients are enlightened on how best they could profitably trade. ICT plays a big role in crops marketing. This is reflected in many countries where information policy plans are implemented to enhance both domestic and international trade (Agu, 2013). ICT makes it possible for agricultural extension workers, farmers, traders to share and have access to reliable information on crop marketing strategies. The lack of reliable market information represents a significant impediment to crops market especially for small scale holder poor farmers. Imperfect and asymmetric information between farmers and traders affects their bargaining power and terms of trade between contractors (Wyche and Steinfield, 2015).

Research problem

This study was triggered by the desire to assess if at all the proliferation of Information Communication Technologies; especially due to the growth of mobile technologies in Zambia have had any leverage on crop marketing. This was further motivated by the view that there exists a gap in empirical research with regard to leveraging ICT for crop marketing in Zambia. Questions have been raised about timely knowledge on who is buying crops today, how much one is able to pay and where these are located. Unfortunately, there is information asymmetry on crop marketing in most developing countries. This has been identified as

one of a critical constraint to farmer's access to market opportunities in African countries (Aker and Ksoll, 2016). What is more is that in Zambia liberalization of agricultural markets in the 1990s introduced new challenges to farmers who are now facing such markets which are neither competitive nor transparent and are greatly disadvantaged, especially those in remote areas. Further, most often, studies on ICT have underscored their effect on general socio-economic welfare (Salahuddin and Kamarul, 2016). Moreover, little attention has been given to leveraging ICT in crop marketing; despite its wide suitability and placement for resilience building of the economy. This study therefore, is envisaged to play a greater role in filling the knowledge gap that exists in Zambia in leveraging ICT for crop marketing particularly in the Northern Province of Zambia.

Research objective

The objective of the study was to examine leveraging of Information Communication Technology (ICT) for crop marketing in Northern Province of Zambia.

Literature review

A comprehensive analysis of literature is highly recommended throughout any research study in order to identify and discovering the gaps in the past work. A considerable amount of literature has been published on ICT linking it with many relevant areas. However, these studies have not concerned with leveraging ICT for crop marketing in the agriculture sector in Zambia. However, a number of research papers and articles provide some insight about the ICT practices and crop marketing.

The findings from the literature are presented below:

In recent years, there has been an increasing interest in how to improve farmers' productivity and marketing strategies. In their studies Larochelle et al. (2019) proved that when a sound strategy for leveraging ICT is in place and thriving properly it has transformational effect on crop marketing. Further, this study established that farmers who received text messages from agricultural extension workers had significantly higher knowledge than their counterparts who did not. Conversely, they were more likely to adopt most of the new technological practices than their associates. Subsequently, many African governments have put in place ICT policies in crop marketing, which are a positive sign. Similarly, several attempts have been made by African governments to invest in Information Communication Technologies for them to build capacity in marketing and trade. However, these have been impinged by the fact that African governments import almost all equipment and technology. Aleke, Ojiako and Wainwright (2010) observed that the continent might become a dumping ground for absolute technologies. This means that the cost of Information Communication Technologies will ever be high and it is difficult for developing nations especially in Africa to be up to date in various technologies.

Fu and Akter (2016) have pointed out that marketing professionals now appreciate benefits accrued in adding Information Communication Technologies on their business agenda. Further, a number of business entities in Africa are now taking Information Communication Technologies programmes seriously. This forms part of their marketing delivery. Kimenyi and Moyo (2011) postulated that although agriculture and natural resources will continue to be significant drivers of Africa's economic growth; it is the application of modern technologies that will have the most substantial influence on the evolution trajectories of most African economies. The issue of growth will come from technological innovation and the adoption of new technologies in services sectors, such as banking, insurance, health, education and agriculture.

In the literature on videos that speak for themselves when non-extensionists show agricultural videos to large audiences by Bentley, Van Mele, Okry and Zossou (2014) the relative importance of leveraging ICT in crop marketing has been subject to considerable debate. Bentley, Van Mele, Okry and Zossou (2014) established that farmers can benefit from agricultural learning videos shown by organisations with little previous agricultural experience. They said videos do not necessarily need to be facilitated by an expert who knows the subject of ICT. In their classic critique of "Look who's talking: the impacts of the intra house hold allocation of mobile phones on agricultural prices" Lee and Bellemare, (2013) analysed the impact and benefits of ICT on crop

marketing. They submitted that the impact of mobile phones on the prices agricultural producers receive for their cash crop was positive. They first looked at the impact on price of mobile phone ownership at the household level and extrapolated it to the national and international level.

In their study "Kenya's Social Development Proposals and Challenges: Review of Kenya Vision 2030 First Medium-Term Plan, 2008-2012" Mwenzwa and Misati, (2014) have pointed out that there still remain high regional inequalities in terms of access to various ICT, whereas access of technologies such as internet, computer, satellite, radio and mobile phone in some developing countries like Tanzania is fast growing. A number of Information Communication Technologies centers have been opened and experts are employed to manage these important facilities. The aforesaid, acknowledges the fact that Africa has realised the importance of Information Communication Technologies. The continent which was once known as a "dark continent" has now opened up to the whole world embracing ICT in all its social economic, political and technological endeavours. The role ICT plays addressing challenges and personal devices such as mobile phones or tablet Personal Computers are becoming more widely important. ICT, embedded in broader stakeholder systems, can bring economic development and growth as it helps bridge critical knowledge gaps.

Aaker, (2015) noted that the tactical use of ICT to the agricultural industry, which is a leading economic sector in most African countries, offers the best opportunities for economic growth and poverty mitigation on the continent. By drawing on the concept of crop production and marketing, Wyche and Steinfield, (2015) in their study titled "Why Don't Farmers Use Cell Phones to Access Market Prices?" were able to prove that ICT is vital to the survival of millions of farmers. They showed that designing successful systems demands greater attention to the broader environment in which mobile phones are used. The importance of using ICT on crop marketing aptly has a vital role on improvement of trade in a country.

In contrast, Oluoch and Osida (2015) affirmed that crop traders enjoy a comparative advantage when using ICT in accessing agricultural information than the farmers themselves. In other words, traders have the more predispositions to seek for information through the use of different ICT facilities like mobile phones for increased cheaper crops; while farmers are absolved in selling their crops cheaply to immediately meet their daily needs. In their studies on "the adoption and use of Information Communication Technologies by small scale farmers in Gezira State, Sudan Musa, Githeko, and El-siddig (2012) found that traders had higher chances of adopting and using Information Communication Technologies than farmers; because most of the farmers had little knowledge and skill in the use of ICT.

Phiri and Bala (2020) conducted a study on ICT with a view to ascertain problems and prospects on crop marketing in the Agriculture Sector in Zambia. Both primary and secondary data were used to establish the problems and prospects of ICT on crop marketing in the Agriculture Sector. The findings revealed that some benefits to be gained by farmers, traders and agricultural workers using ICT in crop marketing were that of interactivity which created opportunities and awareness on the availability of crops' quality, quantity and location. The study concluded that timely knowledge about who was buying the crops, how much one paid and where they were located could be an important tool in decision making by traders, farmers and agricultural extension workers. It enables them to balance their activities.

Research Gap

While the literature review highlighted the significance of the ICT, nonetheless authors did not find literature that underscored the importance of leveraging ICT for crop marketing in Northern Province of Zambia. Literature suffers from large scarcity of studies on leveraging ICT for crop marketing, which becomes the basis of this study.

Methodology

This study used a mixed method approach to collect data, which was both qualitative and quantitative. Data were collected through questionnaire and interview schedules. The total population for the three selected districts in Northern Province of Zambia comprising six camps was 7,840; whereas the total sample size

was 290. A total of 207 farmers was interviewed; 70 in Mbala, 64 in Mungwi and 73 in Kasama. 24 agricultural extension workers in camps and 50 traders were also interviewed besides 4 Agricultural Officials at Ministry of Agriculture Headquarters and 5 Officials from National Farmers' Union. Therefore, the total sample population under study was 290. Further, secondary data were collected from literature review.

Analysis and results

Literacy level

The study sought to examine leveraging ICT for crop marketing in Northern Province of Zambia. As indicated in the methodology, the sampling frame comprised of five target groups i.e. farmers, traders, camp agricultural extension workers, Ministry of Agriculture officials at headquarters and officials from the Zambia National Farmers' Union. The research focused on the districts - Kasama, Mungwi, Mbala; and Lusaka as part of the final destination of crops.

Table 1. Education Levels of respondents

Education Level	Own ICT/ Number	Percentage
No formal	4	1%
7 years	139	47.9%
8-9 Junior Secondary	67	23.1%
10-12 Senior Secondary	37	12.8%
Post-Secondary	43	14.8%
Total	290	100%

Source: Authors' Work, Survey Data – 2019.

Regarding education level (Table-1), most of the respondents had completed Grade 7 (47.9%) followed by 8-9 junior secondary school who were (23.1%); 10-12 senior secondary education constituted only (12.8%). Whereas post-secondary school constituted (14.8%). These figures are almost double of national average which is 12 per cent of gross secondary enrolment (CSO, 2008) suggesting that Northern Province is probably one of the provinces in the country which was doing well in terms of literacy.

Nature of Information Communication Tool Available

During interviews, it was noted that the type of information Commonly available in the study area are mobile phones, radios, televisions with common platforms like the Internet, e-mail, SMS, voice calls, Face Book, WhatsApp. The study has also exposed that there is currently a mandatory government policy which encourages usage of electronic voucher system for farmers to acquire their seasonal farming inputs and this has compelled them to use some form of ICT in their marketing of crops. The suppliers of farming inputs are able to deduct what farmers owe the at the point of sale. It was observed that farmers, traders, agricultural extension workers had challenges on the utilization of ICT for agricultural crop marketing due to high cost of units for bundles, unstable power supply and poor internet connectivity.

Table 2. Usage of ICT tool for Crop Marketing

Type of ICT tool	Ownership		Availability		Tool used for crop marketing	
1) Mobile cell phone	178	(85.2%)	209	(100%)	165	(78.9%)
2) Computer	53	(25.4%)	68	(32.5%)	7	(3.3%)
3) Television	89	(42.6%)	114	(54.5%)	34	(16.3%)
4) Radio	154	(73.7%)	187	(89.5%)	144	(68.9%)
5) Internet/Email	28	(13.4%)	72	(34.4%)	4	(2%)
6) Newspaper/ Agricultural Marketing Magazine	32	(15.3%)	56	(26.8%)	16	(7.7%)

Source: Authors' Work, Survey Data – 2019.

The results show that (Tanle-2), majority of the respondents interviewed own a mobile cell phone 178 (85.2%) and radio 154 (73.7%). The results also indicate that respondents of 165 (78.9%), 144 (68.9%), 34 (16.3%), 16 (7.7%), 7 (3.3%), 4 (2%) are using mobile cell phone, radio, television, newspaper/ agricultural farmers magazine, computer respectively as ICT tool for crop marketing.

Findings and discussion

The leverage of ICT on crop marketing generally varied and was reliant to which precise technology was used. Its usage was likewise influenced by existing ICT infrastructure available to farmers', traders' and agricultural extension workers' level of literacy. The study epitomised that literacy levels of farmers, traders and extension workers had influence on the usage of the type of ICT tool and platform available. It was noted that Short Message Services (SMS), face book, WhatsApp were common platforms utilised by the respondents who had gone up to the senior level of secondary school. This is in congruent to the study in Gezira State, Sudan by Musa, Githeko, and El-siddig. (2012); Yimer, M. (2015) who found that traders had higher chances of adopting and using Information Communication Technologies than farmers; because most of the farmers had little knowledge and skill in the use of ICT as compared to traders who had good education background.

The results also showed that (Table-2) majority of the respondents among them farmers owned a mobile cell phone 178 (85.2%) and radio 154 (73.7%). The results of the study equally, confirms findings of Adégbidi, (2012), Haider, (2014), Nakasone (2016), who mentioned that farmers had a good perception of the role of the mobile cellular phones and radio in marketing of their crops and trade transactions. Looking for buyers for their crops and for supply of inputs was an important matter which saw farmers and traders utilise mobile cellular phones.

The respondents also indicated that they utilised the local radio stations like "Radio Mano" in Kasama and also listened to the National Agricultural Information Services who broadcast agricultural news and technical information on the national broad caster (Zambia National Broadcasting Services) aired every morning at 06:300 am and 18:300 pm. Correspondingly, Permadi (2017) submitted that ICT adoption among farmers and traders increases their skills or knowledge and likewise easy access of agricultural market information. The finding is similarly in agreement with Larochelle, Alwang, Travis, Barrera, Dominguez (2019), who acknowledged that "Information Communication Technologies facilitates interaction between trader and client by means of text, audio, multimedia or both in the presence or absence of face to face interaction". This creates an environment which makes life easier for agricultural workers, farmers and traders to have access to market information thus improving marketing capabilities even in the presence of pandemics like corona virus 2019. Incidentally, there are some evidences of agricultural producers who are finding new buyers through global social networks (Hudson, Leclair, Pelletier, Sullivan, 2017).

This study also discovered that in Kasama district which is a provincial headquarter for Northern Province for instance, established that an average trip for a farmer or trader to a market located 80 km away could take them to travel the three days due to poor road network, as compared to a second's call, which translates to a lot of cost savings where information seeking was concerned. For instance, one would merely spend K0.50; compared to spending K150 on a trip. However, the researchers noted that it is important to recognise that more research is needed to explore exactly when and how to access market price information benefits by crop farmers and traders. In contrast, while there are clearly examples of benefits to farmers in specific cases, Haider (2014) says development practitioners should equally tread carefully before assuming that access to information alone is sufficient for farmers' obtaining higher prices. This entails all things been equal other parameters; should also be taken into consideration. One of the Zambia National Union Officials bemoaned that:

"Information Communication Technology was so important in this era that farmers can thus keep trajectory of updates on the most recent changes in government policies on price of crops."

The Zambia National Farmers Union Official went on to say that it was important for

Government likewise to have clear policies on purchase and expiration of units for bundles for cellular phone users. This has been demoralizing to farmers who do not understand why their money should be lost in the form of expired units of bundles when not utilised within a specified period of time. Similarly, he added that it was essential to promote policies that foster equal access to ICT and vital information needed by different agricultural stakeholders for crop marketing in isolated and remote rural areas to thrive. This also confirms the study by Singh, Bhanotra, Wani (2016) who postulated that ICT impact on traceability of crop market information, reduction operation costs are only a few examples that illustrate its importance.

Investment in ICT for crop marketing contributes to capital deepening and leads to a rise in sales of crop. This multifactor increase in sales of crops arises from the role of ICT in helping farmers and traders create awareness of the presence of their crops. The result is also in line with Mwakaje (2010) who records that ICT supports the growing demand for new methods of production, marketing and sustainability of the farming sector. It also helps to empower farmers by providing better access to improved agricultural technologies, effective marketing strategies. ICT also facilitates the outreach of Agricultural Extension system in the country. It has also the potential to improve the livelihood of the rural farming community on the larger scale. One of the officials from the Ministry of Agriculture headquarters highlighted the challenge of farmers and traders face in using ICT as follows:

"*… the major factors which impede to proper benefit of Information Communication Technology in Zambia among others included lack of knowledge of available Information Communication Technology platforms and reliability of service providers which is coupled with poor infrastructure and equipment."*

He went on to mention that a number of other factors constrain the spread of ICT besides high cost, lack of electricity was lack of monitoring of service providers to check on the billing system of clients especially poor farmers and traders who have no voice to complain on how their units for their mobile phones particularly are utilised. He mentioned that these ICT services providers usually have the capitalist mentalities and do not have a heart for poor farmers.

Conclusion

Based on the findings of the study, it has been established and concluded that farmers, traders and agricultural extension workers have embraced ICT as leveraging tool in crop marketing. There is a trickle-down effect of information sharing among agricultural extension workers, farmers and traders. The study has established that crop marketing had improved since the inception of ICT validated through the flow of current information dissemination processes in several districts under this study. However, this study recognized that their still remain many challenges in the leveraging ICT for crop marketing which hinges on policy and technological matters. The study therefore, recommends the need to build crop marketing capabilities by training farmers, traders and agricultural extension workers in ICT for them to tap into opportunities found therein and as a necessary condition for expansion of crop marketing in Zambia. It also recommends strong monitoring and evaluation systems to be put in place to avoid protect farmers and crop traders from exploitation by service providers.

Policy Implications

The Government needs to shift its focus from mere policy formulation to providing an enabling environment to its citizens for them to develop scientific know how and start manufacturing equipment and software in ICT in order to ensure sustainability of the industry to support crop marketing activities. There is need to invest more in research and development of ICT in Zambia.

Reference

[1]. Aaker, D.A. (2015), Strategic Market Management, 7th Ed., John Wiley and Sons, Inc., Hoboken.

[2]. Adégbidi, A.B. (2012). Impact of ICTs use on access to markets of pineapple smallholder farmers in Benin, Journal of Research in International Business and Management, 2 (9), 240-247.

[3]. Agu, M.N. (2013). Application of ICT in agricultural sector: Women's perspective. International Journal of Soft Computing and Engineering, 2(6), 58-60.

[4]. Aker, J.C., Ksoll, C. (2016). Can mobile phones improve agricultural outcomes? Evidence from a randomized experiment in Niger. Food Policy. 2016; 60: 44–51.
[5]. Aleke, B., Ojiako, U. and Wainwright, D.W. (2010). ICTs adoption in developing countries: perspectives from small-scale agribusinesses, Journal of Enterprise Information, Management, 24 (1), 68-84.
[6]. Bentley, J., Van Mele, P., Okry, F., Zossou, E. (2014). Videos that speak for themselves: when non-extensionists show agricultural videos to large audiences. Development in Practice. 24(7): 921–929.
[7]. CSO (2018). Report for census of population and housing. Central Statistics Office: Lusaka.
[8]. Fu, X., Akter, S. (2016). The impact of mobile phone technology on agricultural extension services delivery: Evidence from India. The Journal of Development Studies. 52(11); 1561–1576.
[9]. Haider, F. (2014). More Farmers Listen, More They Adopt: Role of Local Radio Agricultural Programs in Small Scale Farm Extension, International Journal of Multidisciplinary Academic Research, 2 (3), 20-27.
[10]. Hudson, H.E., Leclair, M., Pelletier, B., Sullivan, B. (2017). Using radio and interactive ICTs to improve food security among smallholder farmers in Sub-Saharan Africa. Telecommunications Policy. 41(7–8): 670–684.
[11]. Kimenyi, M.S. and Moyo, N. (2011). Leapfrogging Development through Technology Adoption. In Foresight Africa. The Continent's Greatest Challenges and Opportunities for 2011, Africa Growth Initiative. The Brookings Institutions.
[12]. Larochelle, C., Alwang, J., Travis, E., Barrera, V.H., Dominguez, Andrade, J.M. (2019). Did you really get the message? Using text reminders to stimulate adoption of agricultural technologies. The Journal of Development Studies. 55(4): 548–564.
[13]. Lee, K.H. and Bellemare, M.F. (2013). Look who's talking: the impacts of the intra house hold allocation of mobile phones on agricultural prices. The Journal of Development Studies, 49 (5), 624-640.
1. Musa, N.S., Githeko, J.M. and El-siddig, K. (2012). The adoption and use of ICTS by small scale farmers in Gezira State, Sudan, Research Application Summary, 625 – 633.
[14]. Mwakaje, A..G (2010): Information and Communication Technology for Rural Farmers Market Access in Tanzania. Journal of Information Technology Impact; Vol. 10, No. 2; pp. 111-128.
[15]. Mwenzwa, E.M. and Misati, J.A. (2014). Kenya's Social Development Proposals and Challenges: Review of Kenya Vision 2030 First Medium-Term Plan, 2008-2012. American International Journal of Contemporary Research, 4 (1), 246-253.
[16]. Nakasone, E. and Torero M. (2016) A text message away: ICTs as a tool to improve food security. Agricultural Economics. 47(S1): 49–59.
[17]. Oluoch, J. and Osida, J. (2015). ICTS and Technological Development in Advancing Tea Research in Kenya, Journal of International Academic Research for Multidisciplinary, 3 (2), 96-106.
[18]. Permadi, R. (2017). The Analysis of Factors Affecting Farmers' Accessibility. Towards Markets and Its Relation to Farmers' Bargaining Position. Journal Management & Agribusiness, 15 (1): 73-82.
[19]. Phiri, J. and Bala, M. (2020). Analysis of ICT on Crop Marketing in Zambia: Problems and Prospect. Texila International Journal of Management, 6(1), 58-66.
[20]. Salahuddin, M. and Kamarul, A. (2016): Role of ICTs in Agriculture/Rural Development and Governance in Taiwan: A Report on Study Visit, Published by Bangladesh Academy for Rural Development, Comilla, Bangladesh.
[21]. Singh M, Bhanotra A., Wani, S.A., et al. (2016). Mobile Phone Technology-An Eminent ICT Tool for Better Family Farming Mobile Phone Technology- An Eminent ICT Tool for Better Family Farming. In: Family Farming and Rural development. 287-291.
[22]. Wyche, S. and Steinfield, C. (2015), Why Don't Farmers Use Cell Phones to Access Market Prices? Technology Affordances and Barriers to Market Information Services Adoption in Rural Kenya. Information Technology for Development, pp.1-14.
Yimer, M., (2015). The Role of ICT for Good Governance and Agricultural Development in Ethiopia: Local Evidence from Southern Ethiopia. International Journal of Political Science and Development, 3(1), pp.30-39.