



ANALYSIS OF ICT TOOLS AND CONSTRAINTS OF ONION MARKETING

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Abstract

This study analyzed ICT tools and constraints of onion marketing in Toro Local Government Area of Bauchi state, Nigeria. A double-stage random sampling technique was employed in selecting the respondents used for the study. Primary data was collected was analyzed using descriptive statistics and Likert scale method. The results revealed various types of ICT tools available to the respondents in the study area; radio (97.6%), analogue phones (81.7%) and android phones (63.4%); were the most prevalent ICT tools used among respondents. The farmers' perception to the use of ICT tools varied across respondents in the study area. Furthermore, the results revealed the constraints of onion marketing, they include; inadequate capital (89%), poor access to credit (80.5%), low technology adoption (75.6%), poor road network (71.9%), high transport cost (69.5%) and poor extension contact (67.1%); these factors significantly affected onion marketing in the study area. Improved access to agricultural credit, farm capital, ICT tools, extension contacts and good road networks are strongly recommended.

Keywords: Constraints, perceptions, ICT tools, marketing, onions

1.0 Introduction

Onion (*Allium cepa*) is one of the most important vegetables in Nigeria, belonging to the family *liaceace* (Alabi and Adebayo, 2008). Its economic importance cannot be over emphasized. It is highly rich in vitamin C and it is a good source of dietary fibers and folic acid. Onions are the 2nd most popular vegetables in the world (OXFAM, 2009). In a year, the world produces 93.17 metric tonnes of onions. The top onion producers in the world are China (22.3 metric tonnes), India (19.3 metric tonnes), and US (3.16 metric tonnes). China's onions are famous all over the world because of their excellent quality and low pricing. In 2017, the top world exporters of onions included Netherlands, China, and Mexico. These countries export onions worth US\$ 545.6 million, US\$ 507.2 million, and US\$ 386.7 million respectively. On the other hand, the major onion importers in 2016 were US, UK, and Malaysia. They import onions worth US\$ 456 million, US\$ 213 million, and US\$ 166 million. Onion (*Allium cepa*) is also grown in African countries such as Nigeria, Niger, Ethiopia, Burkina Faso and Senegal. It is exclusively cultivated throughout the country under



a wide range of climatic conditions. Dry Onion is one of the vegetable of focus under Agricultural Transformation Agenda (ATA) of the Federal Government of Nigeria. The growing of onions is empowering and rewarding, it cuts across different class and culture. Its consumption is spread throughout the year and there is a constant demand for onion all year round. There is a shortage of supply of onions to the southern, eastern and western part of Nigeria which is a problem because most of the onion produced in Nigeria comes from the Northern part of the country, such as Kano, Sokoto, Borno, Bauchi, Jigawa, Kastina, Zamfara. Agricultural marketing is the process of making agricultural products available in the form, place and time required by the consumer (Olukosi *et al.*, 2005).

A well-developed market for agricultural produce provides access to consumers who depend on the market for their food supplies, and farmers who shift from subsistent farming to commercial production. An increase in marketable crops, call for larger and improved marketing facilities. If markets function efficiently, farmers would allocate their resources according to their comparative advantages and intensify their production. An efficient marketing system is an important means for raising the income levels of farmers and for promoting economic development of a region (Tamimi, 1999). However, Obasi and Emenam (2014) asserted that marketing usually begins at the farm, when the farmers harvest his products. The product when harvested cannot get to the consumer; firstly, it is likely to be located some distance from the place of consumption in a regular and continuous manner, throughout the year. Secondly, storage is required to adjust supply to meet demand. Thirdly, a product, when it has been harvested, is rarely in a form acceptable to consumers. Hence, it must be sorted, cleaned and processed in various ways and must be presented to consumers in convenient quality and quantities for sale (Asogwa and Okwoche, 2012). Also, Nemeth *et al* (2007) states that onion is marketed mainly as a fresh fruit vegetable and features prominently in most household consumption needs.

Seasonality as well as cost and location to the market may influence distribution from producers to consumers. Information and communication technology is a term used for communication devices and applications. It refers to technology that provides information through telecommunications such as print media, radio, television, mobile phone and Computers. It comprises of new technologies as well as old technologies which have been put together to give efficient and effective information processing and communication. Through different studies in various countries, it has been demonstrated that investment in ICT be it mobile technology internet positively correlates with GDP- Gross domestic products. Access to information, an important input for making agricultural decision in production, marketing and finance has historically been very costly in Africa. Farmers who want to sell their products have to search for the right place and price the right buyers and often travel to market their goods, loading and unloading of commodities in search of buyers or brokers sometimes cause deterioration of perishable commodities.

Excessive market searching cost causes small holders to produce very limited range of goods and services. In the extreme case it leads to household to produce only for home consumption. It may also cause them to apply low levels of external input and become less responsive to market changes. ICT can offer small holder farmers the opportunity to create network with other farmers. Obtain market information and access information (Ifad 2008). Due to their potential and the recent surge in mobile phones ownership throughout Sub Saharan Africa,



ICTs have become an important consideration for social and economic development programs. Singh *et al* (2015) reported that Agricultural information system is a computer based information system which contains all interrelated information which could really help farmers' in managing information and policy decision making. The ICT device that help to facilitate farming activities encompassed application like radio, television, cellular phones, computers, tablets and networking current researches establish possible benefits of ICT in the advance of agricultural technology have been well documented. This is likely due to the fact that farmers are increasingly accepting new technological revolutions in farming system. Through the use of ICT, farmers can create new opportunities by penetrating international market and get contact with new partners and exchange relevant information for their business sustainability. Consequently, farmers can advertise their goods both in national and international market. Similarly Yimer (2015) indicated that ICT furnish up to date knowledge and information on Agricultural Technologies, best practices, market prices trends and weather condition. The above argument also agreed with Munyna and Adera (2009) that ICT help in providing capacity building, access marketing and credit, restructuring of extension and scaling up inter linkages of development interventions. Ramil *et al* (2015) who have proven that ICT is an effective solution to problems that occur in the agricultural industry such as weak marketing linkages, poor information management, low productivity, low income and lack of diversity.

Agriculture is an important sector with the majority of the rural population in developing countries depending on it. Agriculture in the 21st century is one of the most diverse economic sectors, encompassing individual farmers, farmers' organizations, government agencies, research institutes, traders, multinational corporations, NGOs and many others. The sector faces major challenges of enhancing production in a situation of dwindling natural resources necessary for production. The growing demand for Agriculture products, however also offers opportunities for producers to sustain and improve their livelihoods (McNamara, 2009). Information and communication technologies (ICT) play an important role in addressing these challenges and improving the livelihoods of the rural poor. The advent of Information Communication Technology (ICT) and its subsequent adoption by both the developed and developing countries ushered in the application of electronic extension for information dissemination for agricultural producers. Thus, nations that have acquired the necessary ICT infrastructure have been moving progressively into the post industries information- based economy (Alleman, 2005).

ICTs are major catalyst for information and knowledge that can create development opportunities and choices for rural communities whose livelihood depend largely on agriculture. Information is the pivot around which development revolve provision of current and up-to-date information to the rural populace on the various activities such as current market prices of goods, market locations, simple food processing, weaving, dying fashion and designing, agricultural practices. It is essential for increased productivity and income growth. Since information is prerequisite for sustainable development and agriculture, farmer's access to ICTs infrastructure is important to increasing the flow of information and this information could serve as a means of empowering the farmers to face the challenges of their immediate environment in the process of carrying out their business effectively. The contribution of ICTs to the overall improvement of the farming business and attainment of the goal of every farmer cannot be over emphasized. In the light of this background, farmers, awareness of various



ICTs in marketing must be looked into with view to analyzing their knowledge and perception on ICTs in marketing onions in the study area. Several factors affect Agricultural commodity marketing which includes distance, cost of transportation, seasonal variation, storage, processing, grading and communication among others as hindrance to the flow of goods in the Agricultural sector (Alabi and Adebayo, 2008).

Over the years, there have been inefficiencies in the marketing of agricultural commodities including onion as a result of these problems. Onion is transported from north to the east; thus, most time these farmers receive very little while the middle men and retailers receive more, this exploitation has to stop. The distorted marketing channels and the price fluctuations also constitute a problem. The appropriate use of information and communication technologies (ICT) is pertinent to the improvement of farmer's income. Information and communication technologies are unique tool in the fight against poverty which is influenced by weak market links, high transportation cost, low return on investment, low savings etc. ICTs have been associated with an increase in efficiency, productivity, and communication between buyers and sellers while reducing waste and price dispersion (Aker 2011; Muto and Yamano 2009) more recent technologies such as cell phones and increased internet access have the potential to democratize information access, especially in places where communication infrastructures is lacking. Despite these benefits of ICT's their adoption throughout sub-Saharan Africa has not been uniform. In Nigeria, where majorly all the rural populaces are farmers, subscription rate for mobile and internet communication is still quite high when available and in some very rural areas connectivity may be very poor. This high rate of subscription, coupled with other factors such as poor electricity supply, bad network constitute a major constraint to farmers even when they tend to adopt new ICT technologies. In the opinion of the authors there is little empirical evidence on the use of ICTs by farmers in Nigeria, this research aims to provide answers to some research questions that would be a guide to policy makers, farmers, and farmers group.

1. What are the types of ICT tools used in the study area?
2. What are the farmer's perceptions of ICT tools?
3. What are the constraints of onion marketing?

Methodology

Study Area

The study was carried out in Toro Local Government of Bauchi state. It has an area of 6,932km². Bauchi has a tropical savanna climate. Toro has 11 wards namely Jama'a, Lama, mara, Geji, Ribina, Tama, Tilden Fulani, Toro, Ubinu, Rishi.

Sampling Procedure

A double-stage random sampling technique was employed in selecting the respondents used for the study. In the first stage, Toro Local Government Area (LGA) was purposively selected due to the predominance of onion producers. The second stage, involved the systematic selection of onion traders using a list in the study area compiled by the staff of Fadama III programme. Using a constant sampling proportion of 0.02 (2%) a sample size of 90 respondents was selected from a sample frame of 4520 farmers, while only 82 questionnaires were retrieved and used for the purpose of this study.



Method of Data Collection.

Primary data was collected using well-structured questionnaires.

Analytical Techniques

The analytical tools used for this study include descriptive statistics (frequency counts and percentages) to analyze the types of ICT tools available and constraints of off season onion marketing; while Likert scale method was used to measure the perception of ICT tools among respondents.

Likert Scale Method

A 5 point likert scale was used to measure the perception of ICT tools among respondents in the study area; where 1= strongly disagree, 2 = disagree, 3 = not sure, 4 = agree and 5 = strongly agree. To determine the mean, Likert scale levels of each item was calculated by multiplying the frequency of each response pattern with its appropriate nominal value and divide the sum with the number of respondent to the items. This can be summarized as follows:

$$X_s = \sum fn / N \dots\dots\dots (1)$$

Where: X_s =mean score; \sum =Summation; f =frequency; and N =number of the respondent

$$X_s = 1+2+3+4+5 = 15/5 = 3 \dots\dots\dots (2)$$

The respondents’ perception was therefore ranked using the mean score on the Likert scale

Results and Discussion

ICT Tools

Table1: Distribution Based Oon the Types of ICT Tools Used by the Farmers

ICT tool	Frequency*	Percentage
Android phone	52	63.4
Analogue phone	67	81.7
Radio	80	97.6
Television	21	25.6
Computer	5	6.1
Print media	2	2.4

Source: Field survey (2019); *multiple response

Table 1 revealed various types of ICT tools available to the respondents in the study area; Radio (97.6%) was the most used ICT tool; followed by analogue phones (81.7%) and android phones (63.4%); this can be attributed the fact that the other forms ICT tools are very expensive and beyond the reach of the respondents. Policies modifications regarding cost and accessibility of /to ICT tools should be put in place so as to encourage farmers to utilize ICT tools in carrying their marketing activities. This corroborates with the findings of Anoop et al., (2015); Aker, (2011) who also reported similar results.

Perception of ICT Tools

Table 2: Distribution based on Farmers Perception of ICT Tools

Perception	Strongly agree	Agree	Not sure	Disagree	Strongly disagree	Weighted Sum	Weighted mean
ICT is only used by young people	42	15	5	08	12	313	3.81
ICT has no benefit to agriculture	6	9	23	25	9	194	2.36
Using ICT is a waste of time	27	16	13	16	10	280	3.41
ICT can be used to sell produce	10	20	24	19	9	249	3.03
ICT can help circulate market information	9	18	20	20	15	232	2.82
I do not use ICT because I don't know how to use it.	23	23	14	14	8	285	3.47
It is expensive to use it	31	24	11	11	5	311	3.79
I do not use ICT because of poor network	14	24	14	10	20	248	3.02

Source: Field survey (2019)

The table 2 revealed the farmers' perception to the use of ICT tools; the respondents agree that ICT is only used by young people (3.81), others opined that it was expensive to use (3.79), some also agreed that they do not use ICT because they do not know how to use it (3.47), while some posited that using ICT is a waste of time (3.41). Furthermore, some stated that they were not sure if ICT medium could be used in selling their produce (3.03) this agrees with the findings of Aldosari *et al.*, 2019 and Chhachhar *et al.*, 2014; that despite the benefits of ICT some farmers remain undecided on the effectiveness of mobile phones as the source of agricultural information. In addition, some respondents don't use ICT tools due to poor

network (3.02) and some other respondents were not sure if ICT tools can help in circulating market information (2.82), this findings does not conforms with Sife *et al.*, 2010 and Aker, 2011 who stated that mobile phones provides timely information exchange to farmers and are quite effective in accessing to information on agricultural technologies. Also, some respondents disagreed that ICT has no benefit to Agriculture (2.36). This study therefore suggests that extension agents and other stake holders should take necessary steps to sensitive farmers on the use and benefits of ICT tools particularly in carrying out their marketing activities.

Constraints of Onion Marketing

Table 3: Distribution Based on the Constraints of Onion Marketing

Constraints	Frequency*	percentage
High transport cost	57	69.5
High cost of storage	28	34.1
Poor road network	59	71.9
Poor access to credit	66	80.5
poor extension contact	55	67.1
Post-harvest loss	20	24.4
High cost of labour	17	20.7
Poor market price	26	31.7
Low technology adoption	63	75.6
Inadequate capital	73	89

Source: Field survey (2019); *multiple response.

Table 3 revealed the constraints that affect onion marketing, they include; inadequate capital (89%), poor access to credit (80.5%), low technology adoption (75.6%), poor road network (71.9%), high transport cost (69.5%) and poor extension contact (67.1%); these factors significantly affected onion marketing in the study area. This corroborates with the findings of Ibrahim *et al.*, 2016; Olukosi *et al.*, 2005; Grema *et al.*, 2015 who also reported similar results.

Conclusion and Recommendations

This study analyzed ICT tools and constraints of onion marketing in Toro Local Government Area of Bauchi state, Nigeria. The results revealed various types of ICT tools available to the respondents in the study area. The farmers' perception to the use of ICT tools varied across respondents in the study area. Furthermore, the results revealed significant factors that



constrain onion marketing in the study area. Based on the findings of this study, the following recommendations are made for policy actions to improve the level of ICT tool utilization and improve efficiency in onion marketing in the study area;

- Measures should be adopted to improve farmer's access to agricultural credit and farm capital; through both formal and informal sectors.
- Policies that will encourage use of ICT tools among farmers should be adopted.
- High transport cost can be attributable to poor road network; the study therefore suggests that measures should be taken to improve the road condition as well as build easy connecting routes to markets.
- The problem of inadequate agricultural extension has to be properly addressed in view of the vital role of extension. Hence, it is recommended that more extension agents should be trained on the use of ICT so that they can effectively disseminate useful information to the farmers and sensitize them on the benefits of ICT tools utilization.

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