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ASSESSMENT OF EXTENT OF USAGE OF INFORMATION AND COMMUNICATION TECHNOLOGIES AMONG SMALLHOLDER CASSAVA FARMERS IN BENUE AND NASARAWA STATES, NIGERIA

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Abstract

The study assessed extent of usage of information and communication technologies among smallholder cassava farmers in Benue and Nasarawa States, Nigeria. All registered farmers were the respondents. Questionnaire was used to collect data from a sample size of 279 respondents. Data collected were analyzed using descriptive statistics. The findings revealed that in Benue State mobile phone had a mean of ($\bar{x}$= 4.55), while Nasarawa State had ($\bar{x}$=3.71). Pooled result indicated that mobile phone had a mean of ($\bar{x}$=4.13). The extent of usage of mobile phone was highest among other information and communication technologies. The result on effects of usage of information and communication technologies shows that all the variables across the States had mean above 2.50. The mean results indicated that the effects of usage of information and communication technologies were total flow of information, access to new technology, reduced activities of middle men, better service delivery, increase in crop production, increased market opportunities, increase in income and improved standard of living among others. It is therefore recommended that information and communication technology devices should be subsidized for farmers and they should be trained on how to use them in order to motivate them. Loans should be given to farmers to enable them buy information and technology tools and meet other farm expenses and all the necessary infrastructure should be provided to enable farmers access and use information and communication technologies.

Keywords: Assessment, information and communication technologies, usage, smallholder, farmers.

1.0 Introduction

Information and communication technologies (ICTs) play important roles in every aspect of human activities today, including agriculture. Many rural communities in developing countries, are currently experiencing an unprecedented revolutionary

trend in agricultural development due to the development and widespread adoption of ICTs (Khidir, 2019). The use of ICTs by smallholder farmers in marketing their produce contributes to removing intermediaries, reducing costs and quickly reaching potential customers (Bachaspati, 2018). ICTs provide a platform for increased amount of information that can be transmitted to all participants in the agricultural sector as well as decrease the cost of dissemination of information (Ali *et al*., 2015). It makes access to agricultural information easier. It also enables a large number of people to be reached in a short time, this provides remedy to the shortage of agricultural extension workers recorded in Nigeria (Dire *et al*., 2016). Information and communication technologies play a very vital role in facilitating information exchange among smallholder farmers. It is obvious that individuals that receive appropriate and timely information will make better decision.

Oladele (2015) defined ICT as all technologies that allow for the efficient and cost-effective flow of information. According to Ologundudu and Eniola (2021), ICTs can be interpreted broadly as technologies that facilitate communication, processing and transmission of information by electronic means. The World Bank (2011) defines ICT as any device, tool or application that permits the exchange, or collection of data through interaction or transmission. ICT encompasses both the Internet-enabled sphere as well as the mobile sphere, which is powered by wireless networks and it includes technologies such as radio, television, mobile phone, computer and other information technologies (Pawar and Yadav, 2021). According to Nwagwu and Opeyemi (2015), smallholder farmers are the major players of agricultural production in Nigeria, their ability to use improved production technologies is one of the important roles of ICTs in agriculture. It is generally believed that increased information flow has positive effect on farming operations (Adamides *et al*., 2013). It is therefore, expected that there should be a flow of knowledge and new information from various research institutes to the farmers, especially cassava farmers.

Africa produces over 54% of the world's cassava, with Nigeria taking the lead globally with a production of about 57.8 million metric tons (FAO, 2017). Cassava has increasingly gained prominence, industrially, economically, and nutritionally, over the years because of the multi-uses of its starch-rich roots (Olaniyi *et al*., 2013). Cassava has been transformed from being a staple food to a source of income as well with potentials

of being valued as a major foreign exchange earner that can impact positively on the economy of Nigeria. The crop can be processed into several secondary products. These products include chips, pellets, flour adhesives, alcohol and starch, which are vital raw materials in the livestock feed, alcohol, textile, confectionary, wood, food and soft drinks industries. They are also tradable in the international market. However, the bulk of this production outputs are in the hands of small-scale farmers who cultivate 0.5 to 5 hectares of land (Kwame and Dakwa, 2010). In order for cassava farmers to function effectively and efficiently, they need good information on a variety of subjects such as production, processing, storage and marketing. It is expected that modern ICT can play an important role in bridging information gap and reduce the information asymmetry that exists between the large and the small cassava farmers by making the content precise, timely and localized and thus enhance dissemination of information on technologies, inputs, markets and prices.

Over 80 percent of the farming population in Nigeria are smallholder farmers residing mostly in rural areas (Anamam, 2013). Smallholder farmers are mainly responsible for self-sufficiency of food in Africa and cultivation of export crops. They are also very significant in world development with 50% of world's population depending on them. The usage of information and communication technologies by smallholder farmers improve their knowledge of production and also enable them to know and be aware of innovations. The potential benefits of ICT to farmers and farm processes call for the need to understand effects of usage of ICTs.

2.0 Objectives of the Study

The broad objective of the study was to assess the extent of usage of information and communication technologies among smallholder cassava farmers in Benue and Nasarawa States, Nigeria and the specific objectives were to:

i. identify the extent of usage of information and communication technologies by smallholder farmers in Benue and Nasarawa States, Nigeria and
ii. determine effects of usage of ICTs by smallholder farmers in the study area.

3.0 Methodology

The study was conducted in Benue and Nasarawa States, Nigeria. The States are located in North Central Zone of Nigeria, commonly referred to as the North central region or the Middle-Belt region.

Benue State lies within the lower river Benue in the Middle –Belt region of Nigeria. Its geographic coordinates are longitudes 6° 31 E and 10°E of the Greenwich Meridian, and latitudes 6° 30' N and 8° 10' N of the equator [Benue State Agricultural and Rural Development Authority (BNARDA, 2005]. Benue State has a land mass of about 33,955km with 23 Local Government Areas. The State is divided into three agricultural zones, namely; Northern Eastern Zone, North Western Zone and Southern Zone. Benue State has a projected population of 6,120,524 in 2020 based on the world Bank annual population growth rate of 2.1 % for Nigeria (Wold Bank, 2020). The State has favorable agro-climate ecologies for arable crops, tree crops and livestock production and enjoys two distinct seasons, namely; wet and dry season. Annual rainfall record varies from 1700mm in the Southern part to 1250mm in the Northern part, with annual temperature variations of 30°C - 38°C (BNARDA, 2005). These features create favorable conditions for the cultivation of crops such as yam, cassava, sweet potato, maize, millet, rice, soybean, groundnut and beniseed. Citrus, sugar cane, oil- palm and banana are other crops grown in the State. Livestock rearing such as cattle, sheep, goats, pigs and poultry are also practised in the State.

Nasarawa State is located between latitudes 7^0 N and 9^0 N, and logitudes7^0 E and 11^0 E, and a total land mass area of about 27,137.8 Sqkm. The State has an estimated population of 4,786,575 based on the World Bank annual population growth rate of 2.1 %. The State has 13 Local Government Areas. Nasarawa State lies within the Guinea Savannah region and has tropical climate with moderate rain fall. The State is made up of plain lands and hills measuring up to 300ft above sea level at some points, with annual mean rain fall of 1311.75cm and daily temperature range of 25- 37. The major economic activity carried out in Nasarawa State is agriculture and crops produced include cassava, rice, yam, maize, beans, guinea corn, acha and millet. Processing of salt is another major economic activity in the State, Nasarawa produces a large proportion of the salt consumed within the country. The State is blessed with precious mineral resources like columbite, coal and aquamarine and hence the name 'home of solid minerals'.

The population of the study consisted of all smallholder cassava farmers in Benue and Nasarawa States, Nigeria. A sample size of 279 respondents was selected using stratified, purposive and simple random sampling techniques. At the first stage, two States were purposively selected from North Central region of Nigeria due to high

concentration of smallholder cassava farmers. The States were Benue and Nasarawa States; Secondly, the population was stratified based on the agricultural zones in the States. At the third stage of sampling, two Local Government Areas were selected from each of the agro-ecological zones of the States using a simple random sampling technique. The selected Local Governments Areas from Benue State were Vandeikya and Ushongo from Northern-Eastern zone, Gboko and Guma from North- Western zone and Oju and Ohimini from Southern zone. From Nasarawa State, Keana and Lafia were selected from Southern zone, Nasarawa and Toto from Western zone while Nasarawa Eggon and Keffi were selected from Central zone. The fourth stage of sampling involved purposive selection of two rural communities from each of the selected LGAs due to high concentration of smallholder cassava farmers. From Vandeikya; Mbagbera and Mbajor were selected; Ikov and Utange from Ushongo; Mbaanku and Gboko East from Gboko; Mbadwem and Nyiev from Guma; Oju and Adokpa from Oju while Ochobo and Awule from Ohimini. Iwagu and Aloshi were selected from Keana; Shabu and Chiroma from Lafia; Kokona and Doma from Nasarawa; Umaisha and Gadagwa from Toto while Wakama and Alizaga from Nasarawa Eggon and Angwan-Iya and Limon-Abaji were selected from Keffi. A sample frame was generated, 3% of the respondents were randomly selected which resulted to a sample size of 279 respondents.

4.0 Results and Discussion

4.1 Extent of usage of Information and Communication Technologies by Smallholder Cassava Farmers

Table 1 shows that in Benue State, mobile phone had a mean of ($\bar{x}$=4.55), while in Nasarawa State it had ($\bar{x}$=3.71). Pooled result indicated that mobile phone had a mean of ($\bar{x}$=4.13) The extent of usage of mobile phone ($\bar{x}$=4.13) was the highest among other ICTs. The implication is that most of the respondents used mobile phone to a large extent in receiving and sending messages on cassava farming in the study area. Mobile phones are very easy to operate, portable, relatively cheap to maintain and the availability of service even in the interior places is very high. This might have made the respondents acquire and use mobile phones for information dissemination to a very high extent. The finding contradicts that of Tata and Ncnamara (2016) who reported a low usage of ICTs by farmers in Southern Africa.

4.2 Effects of using of ICTs among Smallholder Cassava Farmers

Table 2 shows effects of using information from ICTs by smallholder cassava farmers in Benue and Nasarawa States, all the variables across the States had mean above 2.50. Pooled result indicated that all the variables had mean above 2.50 with standard deviation of 1. The implication is that the variables were significant. This is an indication that farmers in the study area derived various effects from using information from ICTs to a very high extent. This might have made the respondents interested in the usage of agricultural information from ICTs in order to obtain more profits from production. The finding is in line with World Bank (2015), that ICT has enabled direct marketing by eliminating the middlemen, thereby lowering transaction costs and enhancing profits.

Table 2: Effects of Usage of ICTs among Smallholder Cassava Farmers in Benue and Nasarawa States (n=279)

States:	Benue		Nasarawa		Pooled		Remarks
Variables		SD		SD		SD	
Low transportation cost	3.85	1.27	3.65	0.93	3.75	1.12	Very high
Increase in income	3.92	1.13	3.63	0.90	3.78	1.03	Very high
Availability of food	3.83	1.21	3.47	1.09	3.65	1.17	Very high
Access to new technology	4.30	0.94	3.39	1.10	3.85	1.12	Very high
Total flow of information	4.45	0.79	3.52	1.08	3.99	1.06	Very high
Reduce activities of middle men	4.42	0.71	3.27	1.12	3.85	1.10	Very high
Availability of goods and services	4.43	0.73	3.43	1.20	3.94	1.11	Very high
Access to resources	4.41	0.81	3.43	1.20	3.92	1.14	Very high
Helps to reduce risk	4.31	0.85	3.46	1.10	3.89	1.08	Very high
Increase in income	4.38	0.86	3.34	1.11	3.87	1.12	Very high
Increase in crop production	4.37	0.71	3.21	1.33	3.79	1.21	Very high
Increase in access to inputs	4.42	0.83	3.27	1.20	3.85	1.18	Very high
Increase in yield	4.33	0.87	3.36	1.16	3.85	1.14	Very high
Improved standard of living	4.35	0.76	3.57	1.10	3.96	1.03	Very high
Access to improved technologies	4.40	0.90	3.42	1.28	3.92	1.21	Very high
Appropriate decisions regarding where to sell their produce	4.34	0.89	3.40	1.07	3.88	1.09	Very high
Increased market opportunities	4.47	0.71	3.39	1.06	3.94	1.05	Very high
Eliminate middle men	4.51	0.67	3.29	1.09	3.91	1.09	Very high
Better service delivery	3.91	1.09	3.79	1.16	3.79	1.17	Very high

Cut -off mean=2.50

5.0 Conclusion and Recommendations

The study concluded that the extent of usage of mobile phone was highest among other ICTs. Most of the respondents used mobile phone to a larger extent in receiving and sending messages on cassava farming in the study area. The flow of information, access to new technology, reduced activities of middle men, better service delivery, increased crop production, increased market opportunities, increased income and improved standard of living among others were the effects of usage of ICTs. It was therefore, recommended that ICT devices should be subsidized for farmers and they should be trained on how to use them in order to motivate them. Loans should be given to farmers to enable them buy ICT tools and meet other farm expenses and all the necessary infrastructure should be provided to enable farmers access and use ICTs.

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