Level of Utilisation of Mobile Phones Among Maize Farmers in Osogbo Agricultural Development Programme Zone of Osun State, Nigeria
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Abstract

The study assessed the level of utilisation of mobile phones among maize farmers in the Osogbo (ADP) Zone of Osun State, Nigeria. Using a three-stage sampling procedure, 120 respondents were sampled and interviewed. Data were analysed using percentages, weighted mean scores (WMS), chi-square, and correlation analyses at p=0.05. The results reveal that the majority (63.3%) indicated a moderate level of utilisation of mobile phones and weather reports ranked first (WMS=2.47) of all the indicators of the utilisation of mobile phones. Increase in farmers' income ranked first (WMS =2.76) of all the perceived benefits of utilisation of mobile phones. There was a significant association between age (χ^2 =22.716), marital status (χ^2= 19.566), level of formal education (χ^2 =24.195), and utilisation of mobile phones. The study concluded that there was a moderate level of utilisation of mobile phones in the study area and recommended that respondents should further increase and improve on mobile phone utilisation as doing this would further increase the various benefits derived from mobile phone utilisation in accessing agricultural information.

Keywords: Level of utilisation, mobile phones, maize farmers

Introduction

The role of timely and appropriate information in agricultural production cannot be over-emphasized. The agriculture industry has experienced significant enhancements in its efficiency and productivity of the value chain through the successful incorporation of Information and communication technology (ICT) (Ayim et al., 2020). Information and communication technology whose role in development has been multi-faceted is a universal information source that disseminates, transmits, and displays data electronically both in developed and developing nations like Nigeria (Nisansala, 2019).

According to Rahman et al., (2020), a mobile phone is a portable communication device that can run programs, send text messages, and make voice calls when it is connected to a wireless network. It is one of the most pervasive information technologies that exist today, even in undeveloped nations. Recent statistics showed

that 62.9% of the population worldwide owned a mobile phone with 4.68 billion users on the planet (Statista, 2019). Mobile phone-based information plays a crucial role in enhancing maize farming by providing farmers with access to timely agricultural extension services, market information, weather forecasts, and pest management advisories. Mobile phones enable maize farmers to receive valuable agricultural extension services directly on their devices. This includes information on crop management practices, pest and disease control, soil fertility management, and best agronomic practices (Kumar et al., 2020).

Maize serves as a good source of food for humans feed for livestock, and also a source of income and foreign exchange earnings to Nigeria (Amanza et al., 2021). Maize is a good source of raw materials for different agro-based industries as it is an essential material for the industrial production of fuel, starch, medicine, and food sweeteners (Egwuma et al., 2019). Maize thereby plays a diverse and dynamic role in global agri-food systems and food/nutrition security (Grote et al., 2021; Poole et al., 2021). In Nigeria, maize is one of the main food crops, has multiple applications as feed for livestock, as well as its use in the baking and brewing sectors, and Ebukiba, 2020 asserted that the demand for maize typically outweighs its supply in Nigeria. One way to effectively address issues of low agricultural productivity and production efficiency is the use of Information and Communication Technology (ICT) (Krell et al., 2020; Mandi and Patnaik 2019; Sharma et al., 2020). It is expected that with adequate agricultural information available to the maize farmers, there will be an enhancement in maize production concerning meeting the increasing consumer demand. It therefore becomes important to assess the level of utilisation of mobile phones in accessing agricultural information among maize farmers in the Osogbo ADP zone of Osun State, Nigeria. The study examined the level of utilisation of mobile phones in accessing agricultural information and identified the perceived benefits of utilizing mobile phones in accessing agricultural information. It was hypothesized that there is no significant relationship between the socio-economic characteristics of the maize farmers and the level of utilisation of mobile phones and that there is no significant relationship between the perceived benefits of utilizing mobile phones and the utilisation of mobile phones.

Methodology

The study area is Osogbo ADP zone, Osun State, Nigeria. Osun State is geographically located at latitude 7°58' North of the equator and longitude 4°28' East of the Greenwich Meridian. It has a population of 4,435,800 (2022 projection, National Population Commission, 2022). The population of the study comprised all the maize farmers in the Osogbo ADP zone of Osun State, Nigeria. A three-stage sampling procedure was used to select the respondents. In the first stage, a simple random sampling technique was used to select three (3) local government areas (LGAs) namely: Ila, Boripe, and Ede North from the zone. In the second stage, two farming communities were randomly selected from each of the selected local government areas. These were Ila-Faje and Ila-Alagbede from Ila Local Government Areas, Iree and Eripa from Boripe Local Government Areas, and Abere and Kajola from Ede North Local Government Areas. In the third stage, a random sampling technique was used to select varying numbers of maize farmers from each of the communities (Ila-Faje (19), Ila-Alagbede (20), Iree (20), Eripa (19), Abere (21) Kajola (21) giving a total of one hundred and twenty (120) maize farmers. The data were collected through the

use of a structured interview schedule and were analyzed using percentages, weighted mean scores (WMS), standard deviation, chi-square (χ^2), and correlation analyses at p=0.05. From a measurement scale of 1, 2, 3, and 4 of never, rarely, often, and always, any indicator of utilisation whose weighted mean score is up to 2 was regarded as the benchmark for the utilisation of mobile phones. From measurement scales of 1, 2, and 3 of "not beneficial, "to a lesser extent" and "to a large extent", any indicator of perceived benefit whose weighted mean score measured up to approximately 2 was regarded as the benchmark for perceived benefits.

Results and Discussion

Extent of Mobile Phone Usage in Accessing Agricultural Information on Maize Production

Results in Table 1 show that the maize farmers used their mobile phones to obtain information on weather reports (WMS=2.47), credit facilities (WMS=2.14), agronomic practices (WMS=2.12), post-harvesting practices (WMS=2.12), workshop training (WMS= 2.07), pests and diseases control (WMS=2.03). Others were a new variety of maize (WMS= 2.01), advisory services (WMS=1.94), market for products (WMS= 1.89), market price (WMS= 1.86), and agro-input supply (WMS= 1.67). This means that mobile phone was mainly utilized for only one out of all the eleven indicators. In other words, the mobile phone was primarily utilized for weather updates.

In addition, mobile phone was rarely utilized for credit facilities, agronomic practices, post-harvesting practices, workshop training, pests and diseases control, and new varieties of maize. This implies that any intervention that would be applied to further enhance the utilisation of mobile phones for accessing agricultural information by maize farmers in the study area should be applied to bring about improved utilisation of mobile phones for all the indicators in ascending order. This result agrees with the findings of Akinwale et al., (2019) that the majority of the sampled respondents used mobile phones to access agricultural information on weather reports.

Table 1: Extent of mobile phone utilisation

Indices	WMS	S D
Weather reports	2.47	1.053
Credit facilities	2.14	0.981
Agronomic practices	2.12	0.871
Post harvesting practices	2.12	0.862
Workshop training	2.07	0.857
Pests and disease control	2.03	0.893
A new variety of maize	2.01	0.903
Advisory services	1.94	0.833
Market for products	1.89	0.877
Market price	1.86	0.702
Agro input supply	1.67	0.665

Source: Field survey, 2023

Level of Utilisation of Mobile Phone

Results in Table 2 show that the majority (63.3%) indicated a moderate level of utilisation of mobile phones, a few (20.0%) of the maize farmers indicated a high level of utilisation of mobile phones and a few (16.7%) indicated a low level of utilisation of mobile phone. This shows that there was a moderate level of utilisation of mobile phones among the maize farmers. These results agree with Rimi et al., (2022) that the majority of the farmers had moderate usage of mobile phones.

Table 2: Level of utilisation of mobile phones for agricultural purposes

Level of utilisation of mobile phone	Values	Percentage
High	>28.47	20.0
Moderate	Between 17 and 27	63.3
Low	<16.15	16.7
Total		100

Source: Field survey, 2023

Perceived Benefits of Utilisation of Mobile Phones in Accessing Agricultural Information

Results in Table 3 show perceived benefits of utilisation of mobile phones in accessing agricultural information are an increase in farmers' income (WMS=2.76), this was followed by an improvement in farming activities (WMS=2.57), easy procurement of agricultural inputs (WMS=2.56), improvement in farm productivity (WMS=2.53), acquisition of new farming techniques (WMS=2.48), while reduction in transaction and transportation costs ranked sixth (WMS=2.44).

This means that an increase in farmers' income, improvement in farming activities, easy procurement of agricultural inputs, improvement in farm productivity, acquisition of new farming techniques, and reduction in transaction and transportation costs are the perceived benefits of the use of mobile phones in accessing agricultural information. This result agrees with the findings of Yekinni et al., (2024) that income and reduction in transaction costs are part of the benefits derived by the respondents in the use of ICTs.

Table 3: Perceived benefits of utilisation of mobile phones in accessing agricultural information

Indices	WMS	S D
Increase in farmers' income	2.76	0.502
Improvement in farming activities	2.57	0.560
Easy procurement of agricultural inputs	2.56	0.577
Improvement in farm productivity	2.53	0.660
Acquisition of new farming techniques	2.48	0.686
Reduction in transaction and transportation costs	2.44	0.619

Source: Field survey, 2023

Relationship between the Socio-Economic Characteristics of Maize Farmers and their Level of Utilisation Of Mobile Phones.

Results in Table 4 show significant association between age (χ^2 =22.716, p =0.000), marital status (χ^2= 19.566, p =0.012), level of formal education (χ^2 =24.195, p =0.000), primary occupation (χ^2 6.107, p =0.047), farming experience (χ^2 =18.744, p = 0.005) and utilisation of mobile phone, therefore, the null hypothesis is rejected.

Age had a significant association with the utilisation of mobile phones. This implied that the utilisation of mobile phones varies among respondents with various age groups sampled for the study. This result might also be because the majority (79.2%) of the respondents were between the ages of 31 and 60 years. This implied that the higher the number of maize farmers between the ages of 31 and 60 years, the higher the likelihood of utilizing mobile phones for accessing agricultural information. This result agrees with the findings of Ibitunde et al (2019) that the age of the farmers had a significant relationship with the effectiveness of mobile phone usage in the Growth Enhancement Support Scheme (GESS).

Marital status also had a significant association with the utilisation of mobile phones. This implies that the utilisation of mobile phones varies among respondents with various marital statuses sampled for the study. This result might also be because the majority (81.7%) of the respondents were married. This implied that the higher the number of married maize farmers, the higher the likelihood of utilizing mobile phones for accessing agricultural information may be. This result agrees with the findings of Khidir (2020) that marital status was a significant determinant of the usage status of mobile phone apps among the farmers.

The level of formal education also had a significant association with the utilisation of mobile phones. This implied that the utilisation of mobile phones varies among respondents with various levels of formal education sampled for the study. This result might also be because the majority (56.7%) of the respondents had tertiary education. This result implies that the higher the number of maize farmers with tertiary education, the higher the likelihood of utilizing mobile phones for accessing agricultural information. This result agrees with the findings of Tham-Agyekum et al., (2024) that there was a significant relationship between the education of farmers and ICT accessibility and use.

Primary occupation also had a significant association with the utilisation of mobile phones. This implied that the utilisation of mobile phones varies among respondents with various primary occupations sampled for the study. This result might also be because the majority (68.3%) of the respondents took farming as their primary occupation. This implied that the higher the number of maize farmers that engage in farming as a primary occupation, the higher the likelihood of utilizing mobile phones for accessing agricultural information.

Farming experience also had a significant association with the utilisation of mobile phones. This might also be because the majority (54.2%) of the respondents had been in farming for between 1 to 10 years. This implied that the higher the number of maize farmers that had been into farming for 1 to 10 years, the higher the likelihood of utilizing mobile phones for accessing agricultural information may be. This result agrees with

the findings of Abdullahi et al., (2019) that there was a positive and direct relationship between the farming experience of the farmers and the use of mobile phones.

These findings imply that age, marital status, level of formal education, primary occupation, and farming experience should be considered by relevant stakeholders to enhance the utilisation of mobile phones in accessing agricultural information by maize farmers in the study area.

Table 4: Association between selected socio-economic characteristics of the maize farmers and utilisation of mobile phone

Characteristics	χ^2-value
Age	22.716**
Sex	3.577
Marital status	19.566**
Religion	0.810
Possession of a functional mobile phone	0.792
Level of formal education	24.195**
Presence as household head	0.567
Primary occupation	6.107*
Cooperative society(-ies) membership	1.320
Experience in mobile phone usage	4.127
Household size	0.741
Farming experience	18.744*
Farm size	3.639

Source: Data analysis, 2023

Results in Table 5 show the Pearson Correlation or Pearson Product Moment Correlation analysis of the relationship between perceived benefits of utilisation of mobile phones and utilisation of mobile phones. The results show a negative and significant relationship between the perceived benefits of utilisation of mobile phones (r= -0. 549, p= 0.000) and utilisation of mobile phones. Perceived benefits of utilisation of mobile phone had a significant and negative relationship with utilisation of mobile phone, this suggests a negative relationship between perceived benefits of using a mobile phone and its utilisation for accessing agricultural information. This may mean that those farmers with lower benefits may likely want to use mobile phones for accessing agricultural information, that is, they are more inclined to use mobile phones than those with more benefits.

Table 5: Relationship between perceived benefits and utilisation of mobile phones

Variable	Coefficient
Perceived benefits	-0. 549**

Source: Data analysis, 2023

Conclusion and Recommendations

There was a moderate level of utilisation of mobile phones and weather reports ranked first among all the indicators of the utilisation of mobile phones. An increase in farmers'

income, improvement in farming activities, easy procurement of agricultural inputs, and others were the major perceived benefits of the utilisation of mobile phones. There was a significant association between age, marital status, level of formal education, primary occupation, farming experience, benefits, and utilisation of mobile phones. The study recommended that respondents should further increase and improve on mobile phone utilisation as doing this would further increase the various benefits derived from mobile phone utilisation in accessing agricultural information. In addition, age, marital status, level of formal education, primary occupation, and farming experience should be considered by relevant stakeholders to enhance the utilisation of mobile phones in accessing agricultural information by maize farmers in the study area.

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