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Adoption of Mobile Phone among Poultry Farmers in Delta State Nigeria

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Abstract: This study was designed to ascertain the level of adoption of mobile phones in information exchange and the constraints of mobile phone adoption by poultry farmers in Delta State, Nigeria. Data were obtained rising questionnaire from 120 respondents. Descriptive Statistics and x^2 were used to analyze the data. The adoption of mobile phone was fairly good. The information exchanged by poultry farmers and other stakeholders were on health problems; request for drugs and feeds, sources of feeds and drugs, request for the attention of veterinarians, poultry product marketers, current prices of inputs/outputs and information about meetings. The veterinary medical practitioners were the stakeholders that poultry farmers exchanged information with most frequently using mobile phones. The others were veterinary product marketers, feed sellers/marketers, other farmers etc. The reasons behind mobile savings quality assurance of reaching the receivers at all times, flexibility/carriability quality and faster access to other stakeholders. The constraints of the adoption of mobile phone included the cost of running a mobile phone and network failure. The result of the hypothesis showed that the farm size and the educational attainment of poultry farmers had significant relationships with adoption of mobile phone. The study recommended accompany for adoption of mobile phones among poultry farmers; poultry farmers associations assistance on mobile phone ownership, extension network coverage to rural areas at lower rates and training on mobile phone operation.

Key words: Adoption, mobile phone, poultry farmers, information, communication, technology, delta state

INTRODUCTION

Mobile telephone is one of the multitude of Information and Communication Technologies (ICT). Food and Agriculture Organisation, FAO[1] defined ICT as technologies involved in collecting, processing, storing, retrieving, disseminating and implementing data and information using microelectronic, optics and telecommunications and computers. In the same way, Asian Development Bank, ADB[2] described ICT as a set of activities that facilitate, by electronic means, the processing, transmission and display of information. According to the Technical Center for Agricultural Development G.A[2] Information and Communication Technologies (ICT) can be interpreted broadly as technologies that facilitate communication and the processing and transmission of information by electronic means. This definition accommodates the full range of ICT, from radio and television to telephones (fixed and mobile), computers and the internet.

From the aforementioned definitions, it is glaring that mobile phone fits into the description of ICT. It therefore, becomes obvious that the application of mobile phone is not entirely new in agricultural extension and rural development.

In recent years, the use of mobile phone has witnessed an upsurge in many rural areas of Delta State. CTA[3] opined that the use of ICT has witnessed an upsurge in recent years in almost all areas of rural life in several African countries despite the persisting problems of access, connectivity, illiteracy, content and costs.

Agricultural extension which depends largely on information exchange between and among farmers and a broad range of other actors is an area in which ICT is known to have significant impact[4]. He went further to say that frontline extension workers who are the direct link between farmers and other actors in the agricultural knowledge and information system are well positioned to make use of ICT to access expert knowledge or other types of information that could facilitate the accomplishment of their day to day activities.

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Considering Poultry farming as a very important enterprise of the agricultural sector, information dissemination on management practices is very crucial to the attainment of self-sufficiency in poultry[5]. Adequate information exchange is needed by poultry farmers and extension workers and other actors in the process of poultry management, especially information on poultry health management, feeds and feeding, marketing, etc. No aspect of poultry management can be over-looked. This is owing to the fact that any factor that affects the livestock negatively also impacts on their production. In poultry, it may result in huge loss to the farmers.

A number of developments in many developing countries in recent times are shaping the future of extension services and are setting the stage for the adoption of ICT[4]. These developments include: user demand for effective and appropriate extension service, dwindling government budgets, advances in telecommunication technology worldwide, globalization and a host of other issues.

In the context of changing paradigms in agricultural extension, where linear information flows are being replaced by pluralistic information flows, new actors such as Non-Governmental Organisations, NGOs, Private Companies, National Agricultural Research Centers, Universities and International Donors are emerging in the technology transfer pathway[4]. The potentials of ICT to make agricultural extension in developing countries more effective appear unassailable. According to Asian Development Bank, ADB[2], ICT has become a powerful tool in providing developing countries with unprecedented opportunities to meet developmental goals far more effectively than before. Governments in many developing countries have reduced their direct involvement in agricultural services provision. This creates a greater challenge for extension services provision. Giving farmers access to a variety of information sources, which are accessible, affordable, relevant and reliable is the ultimate aim of providing agricultural information services[6]. This development reflects a need for alternative sources of information rather than a face-to-face, technology-driven, donor-promoted information service. ICT have been found as the only way in which agricultural extension can achieve this[7].

The telephone is the most basic unit of telecommunications service. The policies and programmes implemented in support of rural telephone services are a critical aspect of the supporting environment for other rural ICT initiatives. Voice communications will usually be the most immediately useful and easily accessible service among rural populations, but a great deal of evidence shows that telephone services are the primary source of revenue for rural telecommunication services. Without the revenue, operators would have no justification to extend their networks to rural areas. Basic telephone services enable agricultural extension stakeholders to creatively and quickly exchange information with the clientele. With the extension of telephone services to the rural areas, it is expected that poultry farmers, most of whom operate in the rural areas, use the mobile phone as they have become affordable to many people and considering the nature of poultry farming which is susceptible to high risk. This study was therefore designed to ascertain the level of adoption of mobile phones in information exchange among poultry farmers. The study answered the following questions: What was the adoption percentage for mobile phone among poultry farmers; What were the types of information exchanged with the use of mobile phones by poultry farmers; Who were among the audience poultry farmers used mobile phones to communicate with; What were the reasons for adoption of mobile phones and What were the constraints confronting the use of mobile phones.

The major objective of the study was to ascertain the level of adoption and the constraints of mobile phone adoption by poultry farmers in Delta State.

The specific objectives of the study were to:

- Determine the percentage adoption of mobile phone among poultry farmers;
- Ascertain the information type exchange between poultry farmers and other stake holders in the poultry industry;
- Determine the stake holders in the poultry industry that poultry farmers communicate with;
- Determine the reason behind the use of mobile phone and
- Ascertain constraints confronting the adoption of mobile phone among poultry farmers.

Hypothesis

Ho: There is no significant relationship between the farm size experience and educational attainment and adoption of mobile phone among the poultry farmers.

Justification for the study: Mobile phone was introduced and became popular among Deltans since the year 2003, rural services of the operators was embarked upon a year after. No study has been carried out on the adoption of mobile phones among poultry farmers. This is because of the dearth of relevant related literature on rural phone services.

It is hoped that a study on the adoption of mobile phone among poultry farmers will unveil some information needed for mobile phone communication development. The findings on the constraints to the adoption of mobile phone will be valuable to agricultural extension agencies in this era of demand-driven extension services taking cognizance of the peculiar nature of the poultry business.

MATERIALS AND METHODS

The study area, Delta State lies roughly between latitude 5°00 and 6°30 North and longitude. It shares common boundaries with Edo State to the north, Ondo State to the north-west, Anambra State to the east and Bayelsa State to the south-east.

Delta State has three agricultural zones corresponding with the senatorial districts in the state. These agricultural zones are Delta north, with headquarters at Agbor; Delta Central with headquarters at Ughelli and Delta South with headquarters at Effurun though Effurun is located in Delta Central agricultural zone.

Delta central agricultural zone was purposively selected for the study because of the large number of poultry farms that abound there. There is no ranch where cattle are reared and goat keeping is not regarded as being economical by the people. The animal farmers here therefore concentrate on poultry farming.

Population and sample: All the poultry farmers formed the population of the study. From the list of poultry farmers obtained from the poultry unit of Delta State Agricultural Development Programme, DTADP Zonal office in Ughelli, there were three hundred and fifty-six (356) poultry farmers. From the list, one hundred and fifty (150) farmers were randomly selected, using the lottery method. The sample population represented the eight LGAs that constitute the Delta Central agricultural zone in the order in Table 1 below:

Table 1: Sample distribution of respondents

Local government areas	No. of respondents samples
Ethiope East	16
Ethiope West	12
Okpe	23
Sapele	19
Ughelli North	37
Ughelli South	25
Udu	10
Uvwie	8
Total	150

Data collection: Data for the study were collected from the respondents by the use of questionnaire. The questionnaire were distributed by block extension supervisors. The questions were highly structured with only a few open-ended questions in order to make responses less cumbersome and to facilitate coding and data analysis.

Data nalysis: Data collected for the study were analyzed using descriptive statistics such as frequency, percentages and means. The hypothesis was tested using chi square X^2 statistics. The means were derived from a 4-point Likert scale of 4-strongly agree; 3-agree; 2-disagree and 1-strongly disagree; with a cut-off point of 2.5 to analyze the type of information communicated; determine the reason behind adoption of mobile phone and ascertain the stakeholders poultry farmers communicated. The constraints to the adoption of mobile phone was analysed using mean derived from a 3-point Likert's scale of 2-very serious; 1-serious and 0-not serious, with a cut-off point of 1.0.

RESULTS AND DISCUSSION

Personal characteristics of respondents: The Table 2 indicates that 80.6% of the respondents were of the age bracket of 31-50 years; 3.3% were between 25-30 years ; while 16% were above 50 years of age. This implies that the respondents were matured enough to take up poultry farming.

Majority 56% of the respondents were males; while 44% were females. The males were more into poultry farming and this was informed by the fact that the practice is very tasking.

Literacy level: Most of the respondents 99.2% had formal education; while 0.6% had no formal education.

This factor is known to enhance the adoption of innovations supported by the study of Madukwe[8] as he stated that educational level of farmers is one of the isolated variables related to the adoption of improved farm practices.

Experience: Most 74.7% of the respondents had between 6-25 years of experience in poultry farming. Minority 10% had above 25 years; while 15%.3 between 1-5 years. This means that they had much experience in the business of poultry farming and were well experienced enough to be serious with this means of income. The implication is that they must have had a web of communication network with other stakeholders.

Farm size: Minority 6.7% of the respondents had below 500 birds in their farm; while 18.7% had between 500-1000 birds in their farms. Majority 57.3% had the bird

Table 2: Distribution of respondents according to socio-economic characteristics N = 150

Variables	Frequency	Percentage
Age (years)		
25-30	5	3.3
31-35	21	14.0
36-40	26	17.3
41-45	33	22.0
46-50	41	27.3
Above 50	24	16.0
Sex		
Male	84	56.0
Female	66	44.0
Education attainment		
No formal education	1	0.6
Primary school education	5	3.3
WASC/GCE	11	7.3
NCE/OND	23	7.3
B.Sc/HND	80	53.3
M.Sc	25	16.7
Ph.D	5	3.3
Poultry farming experience (years)		
1-5	23	15.3
6-10	31	20.7
11-15	24	16.0
16-20	34	22.7
21-25	23	15.3
Above 25	15	10.0
Size of farm (Population of birds)		
Below 500	10	6.7
500-1000	28	18.7
1100-2000	23	15.3
2100-3000	32	21.3
3100-4000	31	20.7
4100 and above	26	17.3

population of 1,100-4000 in their farms and 17.3% had above 4,000 birds in their farms. Poultry farming is highly capital intensive and farmers will not have such large population of birds in their farms and handle their operations with levity. The implication is that with these large populations of birds in their farms, there would be exchange of information between them and other stakeholders in the poultry industry.

Level of adoption of mobile phone among poultry farmers: Table 3 indicates that adoption of mobile phone was fairly good among the respondents as 55.3% of them have adopted it in their poultry farm operations. Some 8% were in the awareness stage; 11.3% in the interest stage; 8.7% in the evaluation stage; while 16.7% were in the trial stage. None of the respondents was not aware of mobile phone. The implication is that majority of the farmers have adopted mobile phones and more are likely to adopt it in their farm operations.

Type of information exchanged by poultry farmers with other stakeholders: Table 4 reveals that 64.30% of the type of information listed were exchanged by poultry farmers using mobile phone, while 35.70% were not among the information exchanged between poultry farmers and

Table 3: Level of adoption of mobile phone among poultry farmers

Adoption level	Frequency	Percentage
Not aware	0	0.0
Aware	12	8.0
Interest	17	11.3
Evaluation	13	16.7
Trial	25	16.7
Adoption	83	55.3

Table 4: Information exchanged between poultry farmers and other stakeholders

S/No.	Information exchanged	Mean score
1	Health Problems	3.60*
2	Request for drugs	3.53*
3	Nutrition Problems	2.01
4	Request for feeds	3.36*
5	Sources of Feeds	2.54*
6	Sources of drugs	3.16*
7	Request for services of veterinarians	3.90*
8	Invitation of Artisan Services	1.81
9	Request for new stock of chicks/birds	2.32
10	Request for the attention of poultry product marketers	3.63*
11	Current market prices of inputs and outputs	3.60*
12	Meetings	3.77*
13	Credit sources/requests	1.93
14	Attention of attendants	2.20

* Information exchange by poultry farmers using mobile phone cut-off score = 2.50 (≥2.50 = Information exchanged; <2.50 ≠ Information exchanged using mobile phone)

Table 5: Distribution of respondents according to their mobile phone ownership status

Ownership status	Frequency	Percentage
Own mobile phone	112	74.7
Do not own one but have access to mobile phone	26	17.3
Do not own one and have no access to mobile phone	11	7.3

other stake holders in the poultry industry. Among the information exchanged using mobile phones by farmers were on health problems, request for drugs, request for feeds, sources of feeds, sources of drugs, request for the attention of veterinarians, request for the attention of poultry product marketers, current market prices of inputs/outputs and information about meetings.

The implication is that the parties involved in the information exchange have access to mobile phones. The information on sources of feeds are exchanged at time of crisis and on sources of veterinary drugs are sought at time when the particular drug in question is scarce.

Ownership of mobile phone: Table 5 shows that 74.7% of the respondents have and operate mobile phones and 17.3% did not own mobile phones, but had access to them; while 7.3% of them did not have or own mobile phones and did not have access to them.

This implies that those who had mobile phones and those who did not have, but had access to them, are located in areas where there was network coverage. These ones were also well enough to operate one. Those who did not own one and had no access to any line in very

remote areas and the cost of using mobile phones operated with antenna is beyond their rich. These ones were suspected to be the small-scale poultry farmers.

The stakeholders in the poultry industry that the poultry farmers communicate with: Table 6 reveals that veterinary medical practitioners were the stakeholders that poultry farmers exchanged information with most frequently using the mobile phone as they had the mean score of 3.30. Other stakeholders who were involved with poultry farmers in poultry management include veterinary products marketers, feed sellers/marketers, other farmers, poultry breeders/chicks sellers and poultry output sellers.

Information exchange include other farmers ($\bar{X}$ = 2.60); veterinary product marketers ($\bar{X}$ = 3.13); feed sellers/marketers ($\bar{X}$ = 2.30) and poultry breeders/chicks sellers ($\bar{X}$ = 2.84).

This implies that most of the farmers do not exchange information with the extension agents of the Delta State Agricultural Development Programme (DTADP). The implication of this finding is that poultry farmers in Delta State were not given the needed attention by the DTADP. This is in agreement with Ofuoku and Ajieh[5] who reported that a greater majority of poultry farmers did not get needed poultry health management information from extension agents of the DTADP.

Reasons for the adoption of mobile phones among poultry farmers: Table 7 indicates that the reasons given by the 83 adopters of mobile phone, for its adoption included faster access to information with a mean score of 3.13; money saving quality (X = 2.80); assurance of getting the receiver's attention (X = 3.37); flexibility (X = 3.41) and it is a faster means of having other stakeholders' attention/services.

This implies that at times of emergency, especially when it has to do with the health of the birds, the attention of veterinarians can be easily sought and even information about their usage veterinary drugs can be sought with little cost. This is in support of Omotayo[4] who opined that the call for demand driven extension opens the door for examination of ICTs which can be cost-effective and practical tools for facilitating and channeling farmers' demands and addressing those demands.

Mobile phone is flexible according to them because it is very portable and can be carried about with little effort.

It is money saving because of the fact that the cost of air time is not as much as the cost of transportation to the sources of information and services/attention needed.

Table 6: Stakeholders poultry farmers exchange information with

Stakeholders	Score	Mean
Extension workers/DTADP	325	2.20
Other farmers	385	2.60*
Veterinary medical practitioners	491	3.30*
Veterinary product marketers	470	3.31*
Feed sellers/Marketers	339	2.30*
Poultry breeders/Chicks sellers	426	2.84*
Poultry output sellers	480	3.20*

Table 7: Reasons for the adoption of mobile phones as given by the farmers (n = 83)

Reasons	Total score	Mean
Faster access to information	260	3.13*
Money saving	232	2.80*
Assurance of getting the receiver	280	3.37*
Flexibility/carriability	283	3.41*
Faster access to other stake holders attention/services	240	2.90*

Cut off score = ≥2.50, * Met Cut-off score, ≥2.50 = reason for adoption of mobile phone, <2.50 = not a reason for adoption of mobile phone

Table 8: Constraints to the adoption of mobile phone among the respondents (n = 150)

Constraints	Mean score
High cost of mobile phone	0.78
Inadequate network coverage	0.96
Lack of network coverage	0.73
Cost of running mobile phone	1.86*
Lack of operating skill	0.80
Network failure	1.26*

Cut-off score = 1.00, (X≥1.00 = Serious constraints, X<1.00 = Not serious constraints), * Serious constraints

Table 9: Result of test of Hypothesis (n = 150)

Variables	Correlation coefficient (r)	Table value
Farm size (population)	0.87*	0.811
Poultry farming experience	0.71	0.811
Educational attainment	0.91*	0.811

*Significant at 0.05 level of significance

Constraints to the adoption of mobile phone: Table 8 shows that out of the listed constraints in the study, 33.3% were considered to be serious to the adoption of mobile phones by the respondents. Among these were cost of running mobile phones and network failure.

The cost of air time is high and it is easily exhausted when one engages in a long communication with the mobile phone. The problem of network failure is not from the operator, but the communication company. This is especially so when one tries to live up with a receiver in a different communication company.

Though the rest constraints were not considered to be serious, they confront the respondents from time to time. High cost of mobile phones were not considered a serious constraint because there are relatively cheap ones these days that are easily affordable. Inadequate and lack of network coverage were also not considered to be a serious constraint because communication masts are inundating many of the rural settlements now.

The implication of the data in table 8 is that the non-adopters considered all the constraints, especially

cost of running a mobile phone and network failure as problems militating against their adoption of mobile phone.

Hypothesis

Ho: There is no significant relationship between the farm size, experience and educational attainment and Adoption of mobile phones among the poultry farmers.

The results of Table 9 shows that farm size (population of birds) (r = 0.87) and the educational attainment of the respondents (r = 0.91) had significant relationship with their adoption of mobile phone in line with a priori expectation. This implies that the larger the population of birds in the farm which translates into high income, the more the likelihood of farmers operating mobile phones, the size of the farm dictates the seriousness of attention needed. In the other case too, the higher the educational attainment of the poultry farmers, the more the likelihood of adopting modern communication technologies such as mobile phones, though the relationships are not perfect ones. Though poultry farming experience had no significant relationship (r = 0.71) with adoption of mobile phones among the respondents, a relationship existed between the two variables.

CONCLUSION

Based on the findings of this study, the following findings and conclusions were made:

- The percentage adoption of mobile phones among poultry farmers in the study area was high. There was a high level of adoption of mobile phones among them.
- The ownership level of mobile phones in the study area was high.
- The major information exchanged between the poultry farmers and other stakeholders in the poultry industry included health problems, request for drugs, requisition of feeds, sources of feeds, sources of veterinary medicines, request for the services of veterinarians, request for the attention of poultry product marketers, current market prices of inputs and outputs and information on meetings.
- The reasons given for the adoption of mobile phones among the poultry farmers included flexibility/carriability, of the phones; assurance of reaching the receiver at anytime; faster means of accessing information and their money saving quality, money saving because one spend less making a call than traveling to meet the receiver. The other reason was that it was a faster access to other stakeholders' attention/services.
- The constraints militating against mobile phone usage were the cost of running mobile phone and inadequate network coverage.
- The tested hypotheses revealed that there were significant relationships between size of poultry farm and adoption of mobile phones and between educational level of poultry farmers and adoption of mobile phones in the study area.

In view of the aforementioned, it was concluded that the level of adoption of mobile phones in the study area was high. This is based on the percentage level of adoption of the mobile phone technology in the study area. The importance of mobile phones in poultry farming cannot be over emphasized as the business of poultry farming involves a lot of communication exchange among stakeholders in the poultry industry.

RECOMMENDATIONS

On the basis of the findings in this study, the following recommendations were given:

- The DTADP should carry out a campaign for the adoption of mobile phones among poultry farmers.
- The Poultry Farmers' Association should have assistance project to help those of their members who do not have mobile phones to own one through advance supplies of these phones and instalmental payments.
- The communication companies should be woed and encouraged to extend their service coverage to the rural areas at lower rates. This will encourage fast access to needed information in these areas.
- Those who are not literate with respect to mobile phone operations should be taught the operations by the extension agents.

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