

Challenges to the Use of Information and Communication Technology Tools for Rural Livestock Production in Imo State Nigeria

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Abstract

The study examined the challenges faced by rural livestock farmers in the use of ICT tools. The specific objective included identifying IT tools used; livestock animals kept; information needs of rural livestock farmers examining challenges faced by the rural livestock farmers in the use of ICT tools and proffer solutions to the challenge. A total of 150 ICT user farmers were used to elicit information from respondents using a structured questionnaire. Data collected were analyzed descriptively. Result showed that the livestock farmers used radio (98.6%), mobile phones(96.6%), television(90%). They also keep poultry birds (98%), pigs (92.6%), and goats (87%). The farmers need information on animal disease/control (90.8%), market & prices (100%), housing techniques (94.2%) availability of loan/credits (97.5%), check availability (86.6%), prices of drugs (84.2%) among others. The challenges facing rural livestock farmers included high communication costs (585), lack of regular electric power supply(87.3%), language problems (80%), lack of computer skills (83.3%), inappropriate content (58.6%), and high level of illiteracy (86.6%) among others. To address the challenges, a regular power supply is provided, network connectivity is improved and training of farmers in ICT use among others.

Keywords: Livestock; ICTs; Farmers; Information; Challenges.

1. Introduction

Nigeria's economy mostly relies on agriculture, with livestock playing a significant role. Livestock farming significantly improves food production, farm energy, manure, fuel, transportation, nutritional security, and earnings for both urban and rural areas. Agriculture, like most industries, relies heavily on information, therefore ICT may be essential in facilitating information transmission [1, 2]. The function of information in the many linkages in the system of livestock farming, namely input/procurement, production, marketing, sales, and health management issues, can be seen from the perspective of development, flow, and management of information and ideas.

The livestock sub-sector is, therefore, one of the main components serving as the source for a farmer to ensure food and nutritional security on one hand and provides incomes and employment on the other hand [3, 4]. It, therefore, plays a very important role in the economy of any nation, including Nigeria. Livestock contributes more than 18% to the income of small farmers and provides livelihood to two-thirds of rural communities. In developing

nations, it provides about 9.8% of the employment opportunities to a certain population of people [5]. It is therefore an essential part socio-economic structure of rural Nigeria as it provides draught power, manure and energy.

Despite the foregoing, low animal productivity caused by livestock owners' lack of knowledge is still a problem and a significant concern for the future [6]. Informal interactions between farmers continue to be the main way that Nigerians get information and modern technologies' effectiveness of traditional extension approaches has decreased in terms of time management, geographical coverage, and people's perceptions. Livestock production can therefore be improved by better extension services, proper management and effective diseases control programme [7] it is necessary therefore to increase livestock production by using modern technologies to meet its growing demand, rapid increase in population and to earn foreign exchange [8]. The delivery of information and knowledge to farmers at the right times and in the right way leads to more productivity and profitability. The use of modern tools-ICT can be used to achieve the above situation. ICT use has the potential to change the economy of livestock, agriculture and rural life in Nigeria as the world over [9]. Farmers need the information to change their level of awareness, attitude and practices, to improve existing situations.

ICT tools can be used to impart information and knowledge, and that in turn will lead to motivation, motivation and action to do something better in the livestock sub-sector. Thus enhanced and smooth communication results in the overall development of the livestock subsector [10]. ICT could help farmers in Nigeria to efficiently access current information and also provide information to buyers and consumers alike through innovative avenues like joining online communities of farmers, advertising in local farmers' markets that might host a neighbourhood website and joining social network sites such as Facebook to build community interest around the farmer's activities [11]. Using ICT can also enable farmers to use their savings in several ways, with many investing their extra income back into their businesses or paying for their children to go to school [12]. These advantages notwithstanding, ICT deployment in livestock in Nigerian communities is expected to be fragmented and light, with disparities according to the level and quality of telecommunication services, ability and demographic characteristics of individuals as well as the scale of enterprises where those individuals are affiliated among others. Farmers who are highly educated or are engaged in large-scale farming, for instance, would most likely deploy ICT more than the others.

Farmers might also quickly inform clients about the availability of products or discuss and negotiate rates using mobile phones and other ICT. Many farmers commute long distances to their farms, necessitating frequent communication with farm managers to stay up to date on farm conditions. In terms of education, farmers might browse the internet or connect with their veterinarian, other farmers, and others to learn how to manage farms, formulate feeds, handle some diseases, and more. ICT will also be very helpful in managing animal health. Animal health issues could arise at any time, just like human health issues, and farmers could need to contact their health care specialists to either visit the farms or offer information about what.

However, evidence suggests that farmers are not benefiting from these technologies at work because of a lack of awareness and information about them. ICT holds out enormous promise for enhancing the availability, calibre, and effectiveness of information distribution in the livestock industry, but it is important to comprehend the fundamental challenges driving the issues and come up with practical solutions. The study, therefore, ascertained the various ICT tools used by rural livestock farmers; various livestock animals kept; identify information needs of rural livestock farmers; examine challenges to ICT use by the livestock farmers, and suggest possible solutions to the challenges identified.

2. Methodology

The capital of Imo State, Owerri, is one of its twenty-seven (27) local government areas.

Imo The state is located between latitudes 4'30N and 6'30N and longitudes 6'50E to 3.3SE. Okigwe, Owerri and Orlu are the three agricultural zones that make up the state [13]. It has a tropical climate that is humid all year round and is surrounded by an evergreen forest and tropical rainforest. The two-week respite in rainfall in August is part of the bimodal rainy season, which runs from March to October. During the dry season, the average yearly temperature is between 50% and 60% [13]. Primary and secondary data sources were the two main data sources employed in this investigation. While secondary data came from books, the internet, and journals, primary data came from field research. A purposive sampling technique was used in selecting the respondents for this study. All ICT-user livestock farmers, one thousand five hundred (1500) in Imo State constituted the population of the study as contained in the list obtained from Agricultural Development Programme in Owerri. A total of 150 ICT-user livestock farmers were randomly selected. Data obtained were analyzed using percentages presented in tabular forms, this was used to analyze all the objectives.

3. Results and Discussions

3.1. Available ICT Tools are known to Respondents

Figure 1 showed that several ICT tools exist for the use of different purposes and businesses. These tools include mobile phones (96.6%) made of different sizes, brands and applications depending on the interest and preference, U-tube (96%), WhatsApp (98%), Facebook (91.3%), flash drive (82.6%), radio (98.6%), television (90%), internet/website (87.3%), personal computers and so on. Others include the SMS-based service (94%), and digital camera (72%) which many farmers and even all of us enjoy today. This finding is in line with Raja, *et al.* [8] who said that the internet has made the world a global community which enables information sharing and exchange very fast and quickly. Several ready online modules and materials on livestock are available to animal rearers for use to solve production problems. The website has now been developed to provide information to livestock rearers to exchange views and information and find the solution to farm problems. Mobiles are also widely used to facilitate

the solving of the day of day issues relating to animal agriculture. Again the internet and its application are highly involved in planning, weather forecast, post-harvest management, marketing, disaster management, extension and advisory management and thus becoming a powerful tool to disseminate knowledge to animal farmers. Forecasting and trend analysis regarding livestock, weather data, utilization, consumption patterns, disease attacks, fertilization and many more may be executed with IT tools.

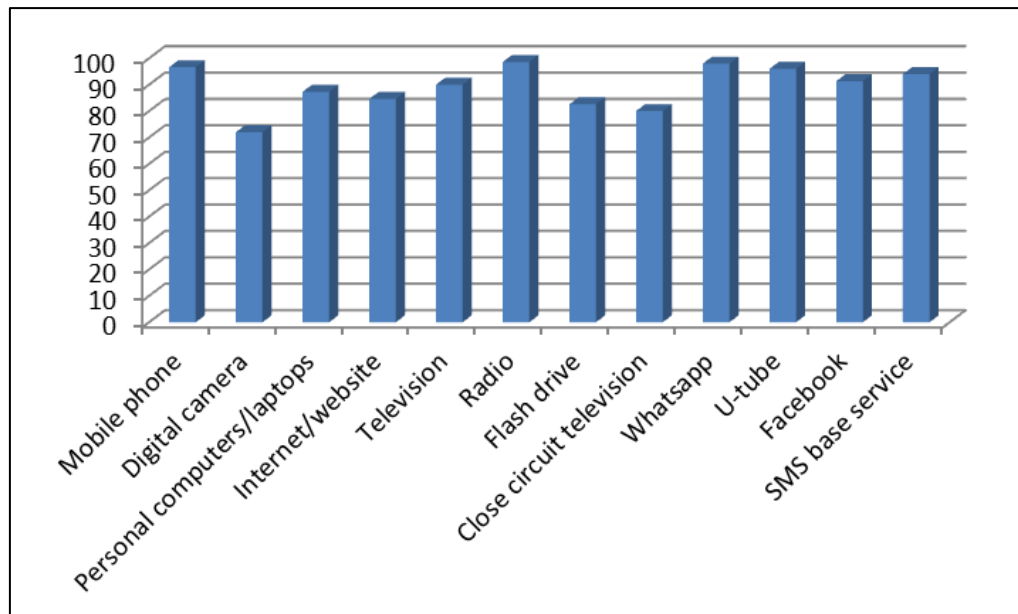


Figure-1. ICT tools and devices available

3.2. Livestock Animals kept by Respondents

Rural livestock rearers keep a variety of animals as shown in table 1: These animals are popular and common in the locality. They are poultry birds (98%) made up of chicken, turkey, duck, goose, and quail among others. Livestock comprises animals kept or raised on a farm to earn income, produce labour and other commodities. Livestock, therefore, is a general term used for animals or birds kept for meat, products, labour or income. They also keep goats (87.3), sheep (69.3%), pigs (92.6%), rabbits (78.6%), snails (86%) and guinea pigs (64.6%).

Table-1. Livestock kept by Rural Livestock Farmers

Livestock kept	*Frequency	Percentage
Poultry birds	147	98.0
Goats	131	87.3
Sheep	104	69.3
Pigs	139	92.6
Rabbits	118	78.6
Snails	129	86.0
Guinea pigs	97	64.6

*Multiple responses

3.3. Information Needs of Livestock Farmers

Rural livestock farmers need of several information for the growth and survival of their business. Table 2 showed the areas of information needs. The table indicates that rural livestock farmers need information on market and prices(100%), availability of loans/credits (80%), availability of good breeds (78%), storage facilities/preservation (78%), land ownership issues(76%), animal diseases (72.6%), nutrition procedures and/feeds (73.3%), housing (75.3%) among other needs. Livestock farmers must fill those needs so that their business will keep going and they make their constitution in improving the socioeconomic situation of the rural populace where they operate. Livestock keepers need information on livestock diseases, breeding techniques, and markets for their products. These can be grouped into five headings-agricultural inputs, extension education, agricultural technology, agriculture credit, and marketing [14]. They may need information on diary management, building materials, feed manufacturing, environmental control, pollution control etc [15]. As also revealed by Biemans, *et al.* [16], acceptance and use of mobile phones, like any other technological devices, are enhanced where facilitating control such as electricity, network, and internet networks are available.

Table-2. Information Needs of Livestock Farmers

Information needs	*Frequency	Percentage
Animal diseases control/treatment	109	72.6
Nutrition procedures & feeds	110	73.3
Markets and prices	150	100
Housing techniques	113	75.3
Availability of loans/credits	120	80.0
Availability of good breeds	117	78.0
Availability of healthy chicks	104	69.3
Prices of drugs	101	67.3
Storage facilities/presentation	117	98.0
Processing of animal products	108	72.0
Issues on land ownership	114	76.0

*Multiple responses.

3.4. Challenges to the use of ICT Tools by Rural Livestock Farmers

Table 3 shows that the use of ICT tools is faced with several problems among them are lack of regular electric power supply (87.3%), language problems (80%), the poor financial base of the farmers (70.6%), lack of confidence operating ICT tools (69.3%), lack of ICT benefit awareness (67.3%). In the study area, the electricity supply is highly epileptic. The farmers stay without electricity for weeks, even months. Language is another problem of ICT use in the area. The only language of communication is English, which is foreign to farmers. Most of them do not understand the English language. The farmers do not have enough capital /income saved for future use. But mostly small-scale petty, their savings are always poor.

Other challenges include inappropriate content (58.6%) which may not be what the farmers need immediately, negative attitude toward ICTs[52%], long-distance trek to the internet service area (51.3%), poor mobile communication network signal (84.6%), this is almost daily, high level of poverty (87.3%), high level of illiteracy (86.6%), lack of skills in handling ICTs tools [83.3%], unavailability/scarcity of ICT spare tools[60%] and far distance/location of repair shops[80%].

The above findings agree with Agwu, *et al.* [17] who posited that the low level of agricultural information exchange among the different stakeholders in the agricultural sector is a major challenge to agricultural development in Nigeria and other African countries. This is a result of limited access to current and relevant information in the form of primary documents and machine-readable databases. There is also the lack of ICT proficiency, lack of ICT benefit awareness, too hard to use, lack of technological infrastructure, cost of technology, trust level in the ICT system, lack of training, system integration and software availability limit the use of ICT by farmers [18].

Agwu, *et al.* [17] have further listed some constraints as hindrances to the use of ICT in agriculture in Nigeria and these constraints include lack of confidence in operating ICT facilities such as computers, CD ROM, lack of competence in handling ICT facilities, lack of adequate time for training on ICT facilities, and unavailability of hardware required by modern ICT. They also mentioned a lack of communication infrastructure; fear that things will go wrong in using ICT, inappropriate contents of ICT messages that do not meet the needs of clients, poor benefits in using ICT, and others. Furthermore, they suggested other challenges such as lack of sufficient trained computer personnel, erratic and fluctuating power supply, poor finance, and lack of adequate awareness about ICT, complexity in using ICT, lack of Internet access to the rural areas, poor communication network, nature of the information provided, high cost of ICT software, high cost of ICT hardware, negative attitude of people to change and general lack of awareness of the importance of ICT in agriculture.

Table-3. Challenges to Use of ICT tools in Livestock Production

Challenges	*Frequency	Percentage
High communication cost	87	58.0
Lack of regular electric supply	131	87.3
Language problem	120	80.0
The poor financial base of farmers	106	70.6
Lack of confidence in operating ICTs	104	69.3
Lack of ICT benefit awareness	101	67.3
Inappropriate content	88	58.6
Negative attitudes towards ICT	78	52.0
Long distance to internet services	77	51.3
High-level poverty	131	87.3
Poor mobile communication network signal	127	84.6
High level of illiteracy among livestock farmers	130	86.6
Lack of skills in handling ICT tools	125	83.3
Unavailability of ICT software/spare parts	90	60.0
Far distance/location of repair shops	120	80.0

*Multiple responses.

3.5. Solutions to the Constraints in the use of ICT

Table 4 show the possible solution to ICT use challenges. The solution includes the provision of regular/continuous power supply (93.3%), provision of soft loans to farmers (70.6%), the establishment of a low-cost repair shop (68.6%), subsidizing the cost of ICT tools (67.3%), improvement of network coverage/connectivity (59%), messages put in farmers language (75%), context appropriate to farmers needs (59.3%), creation of awareness on ICT tools (50%), provision of ICT devices for livestock farmers (50%), educational training of ICT user livestock farmers (93.3%) among others. The above is in line with Kalio, (2020) who posited that to solve the problems of ICT use among poultry farmers in Bayelsa State, Nigeria, the following are essential; (i) extension agents should educate poultry farmers on the benefits ICTs and tools, (ii) the access and use of the more sophisticated ICTs and tools, for instance, the CCTV cameras should be encouraged to be used in poultry farms, as it can play a key role in surveillance to monitor livestock behaviour, poultry attendants on poor management operations and theft that can result to huge financial losses, (iii) Ministry of Agriculture and non-governmental organizations (NGOs) should establish Agro-ICT centres for training of farmers to gain knowledge in manipulative skills in ICTs and tools and (iv) the provision of constant electric power supply to ensure effective utilization of ICT tools.

Table-4. Solution to the constraints in the use of ICT devices

Solutions	*Frequency	Percentage
Provision of regular/continuous power supply	140	93.3
Improvement in network coverage/connectivity	89	59.3
Message be put in farmer language	109	72.6
Provision of soft loans to farmers	106	70.6
Establishment of low-cost repair shops	103	68.6
Subsidizing the cost of ICT tools	101	67.3
Content is appropriate to farmers' needs	88	58.6
Build confidence/trust in ICT tools	55	36.6
Creation of awareness on ICT tools	75	50.0
Provision of ICT devices for livestock farmers	75	50.0
Educational training of ICT livestock user farmers	140	44.0
Use of streaming media to carry local people along	86	57.3

*Multiple responses.

4. Conclusion

The results showed that the livestock farmers keep goats, sheep, and poultry birds among others. They need information on market prices, housing, nutrition, diseases, land availability, breeds etc. Information and communication technologies help livestock experts to exchange and share ideas among themselves. It also helps them to transfer information to non-livestock farmers to aid in the marketing of their products. The use of information and communication technologies for livestock production faces several challenges such as poor network coverage, language, content, and electricity among others. The government and other stakeholders should the necessary facilities to ease the problems of its use.

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