RESEARCH ARTICLE   OJAS0502001-610

THE USE OF MOBILE PHONES BY CATFISH FARMERS AT UTEH FISH FARMING CLUSTER IN BENIN CITY, NIGERIA.

*Uwana, G. U & Obaseki, F. O.

University of Benin, Benin City, Edo State, Nigeria

Corresponding Author Email: godwin.uwana@uniben.edu

ABSTRACT

It is important to understand how catfish farmers use mobile phones in their business activities to enhance the adoption and utilization of mobile phones in fish farming. The study assessed catfish farmers' use of mobile phones for business activities at Uteh fish farming cluster, Edo State, Nigeria. The study examined the business activities mobile phones are used for, the fish farmers' perceived competence, and the challenges faced in using their mobile phones. Data were collected from 71 catfish farmers at the Uteh fish farming cluster through convenience sampling, using a structured interview schedule. Frequency counts, Percentages, means, and correlation were used to analyze the data. The results show the average age of the farmers to be 44 years, farmers were mostly (71.8%) male, and about 90% of them were married. All (100%) of the fish farmers indicated that they used their mobile phones for basic business activities like receiving calls and sending SMS, using social media apps such as WhatsApp, contacting buyers, and taking pictures for business. The Catfish farmers were competent in the use of mobile phones except in obtaining loans (mean = 2.42), using aquaculture apps (mean = 2.62), and checking weather forecasts (mean = 3.62). However, the use of mobile phones by the catfish farmers was constrained by poor network coverage.

Keywords: *Business activities, Catfish, Competence, Farmers, Mobile phone, Uteh fish cluster.*

INTRODUCTION

The Nigerian aquaculture sub-sector presents many opportunities for large-scale production and is a viable solution to achieving the nation's goal of self-sufficiency in fish production (Kaleem and Sabi, 2021). Communication is a vital requirement in all businesses to ensure easy contact with business partners, customers, and staff. Mobile phones used for communication offer significant benefits to fish farmers, making it essential to understand how these devices are used for business activities in Edo State. Despite the global increase in mobile phone usage, there has been limited in-depth research on how aquaculture farmers in Edo State, Nigeria, leverage mobile phones for their business operations (Adisa *et al*., 2018). While mobile phones are envisaged to cover more agricultural activities and penetrate rural areas more than before (Ogbeide and Ele, 2017), there is inadequate information on their impact on commercial activities within the aquaculture industry in Edo State.

The widespread adoption of ICTs, such as mobile phones, is crucial for rural farmers to access first-hand information, ultimately aiming to increase their productivity. Ogunniyi and Ojebuyi (2016) found that mobile phone usage has a positive influence on their agribusiness activities. Without insights into how mobile phones are used in the fish farming sector, extension agencies may struggle to provide farmers with the relevant information and guidance needed to make informed decisions and enhance their operations. Additionally, fish farmers may miss opportunities to integrate ICTs into their business practices due to limited awareness and understanding of mobile phone usage. Therefore, researchers, extension services, and stakeholders in the agricultural sector need to understand how fish farmers use mobile phones to develop targeted support programs and interventions that can enhance the adoption and utilization of mobile phones in fish farming. The objectives of this study include;

    i.   to identify the business activities that the aquaculture farmers use their mobile phones for;

    ii.   to determine farmers' perceived competence in the use of mobile phones for business activities; and

    iii.   to identify key challenges faced in the use of mobile phones by catfish farmers.

MATERIAL AND METHODS

This study was conducted in Benin City, Edo State in southern Nigeria. The state has 18 Local Government Areas (LGAs). The local government areas in Benin City include Egor, Ikpoba-Okha, Ovia North-East, and Oredo. According to the Ministry of Lands and Survey, Benin City is about 1125km², about 8.5km above sea level. It is located between latitude 6°21'N and longitude 5°35'E. It lies in a thick equatorial rainforest zone prone to heavy rainfall. The city is linked by roads to Sapele, Siluko, Okene, and Ubiaja and is served by air and the Niger River delta ports of Koko and Sapele. The population study for this study was the aquaculture farmers who culture fish artificially with earthen ponds or plastic tanks either as part-time or full-time farmers in Benin City, Edo State. Uteh fishing community in Ekiuwa, Ikpoba-Okha was purposively selected for the study due to a large number of fish farmers. This is because it is the biggest fish farming cluster in the state. Data was collected from Seventy-one (71) fish farmers through convenience sampling using a structured interview schedule. The dependent variable was the perceived competence of catfish farmers in the use of mobile phones. This was measured using a Likert scale on a 6-point rating scale ranging from very difficult to use (1) to 6 (very easy to use). Various activities on mobile phones were also examined. Data on socio-economic characteristics such as age, sex, marital status, educational status, and level of

income were collected and analyzed. Challenges they face in using mobile phones was identified by using open-ended questions that allowed farmers to state on their own the difficulties they faced when utilizing mobile phones for fish farming activities.

RESULTS AND DISCUSSION

Socio-Economic Characteristics of Catfish Farmers

The study reveals that the average age of catfish farmers was 44 years, with over 75% of them falling within the age range of 35 to 55 years. This indicates that most catfish farmers are in their active years, with over half (53.5%) between the ages of 35 and 44. Ifejika et al. (2017) reported similar findings, with a mean age of 42 years and over 50% of fish farmers in Nigeria being in early and middle adulthood. This age range suggests that these farmers are well-positioned to leverage mobile phones for their businesses, as younger farmers are generally better users of technology. For instance, Olaniyi and Ismaila (2016) found that younger farmers in Oyo State were more likely to use mobile phones compared to older farmers.

The study also indicates a male dominance in the industry, with 71.8% of catfish farmers being male and only about a quarter (28.2%) female. This confirms the findings of Ifejika et al. (2017), highlighting the high presence of males in the fish farming sector in Nigeria. Increased female participation in small-scale aquaculture could potentially boost production, which is crucial for addressing fish supply shortages in countries like Nigeria, as noted by Barman and Little (2006) and Shirajee (2013).

Additionally, the results show that over 90% of the catfish farmers were married, suggesting that fish farming is perceived as a profitable and stable occupation capable of supporting family needs. The majority of the farmers (66%) held at least a Bachelor's, HND, or OND degree, with one holding a Master's degree. All farmers had at least a secondary school education, indicating that they were literate enough to utilise mobile phones for various aspects of their fish farming activities. Olaniyi and Ismaila (2016) also found that farmers with higher education levels were more likely to use mobile phones for their fish farming activities.

Finally, the farmers reported an average annual income of 4,819,718 naira. This suggests that they can afford to use standard mobile phones with advanced features, such as Android smartphones, which can support various functions in their fish farming operations.

Table 1: Socioeconomic characteristics of fish farmers

		Freq	%	Mean
Sex	Male	51	71.8	
	Female	20	28.2	
Age	Below 24	0	.0	
	25 – 34	9	12.7	
	35 – 44	38	53.5	44
	45 – 54	19	26.8	
	55 – 64	5	7.0	
	65 & above	0	.0	
Marital status	Single	5	7.0	
	Married	64	90.1	
	Widowed	0	.0	
	Divorced	2	2.8	
Highest educational level	SSCE	10	14.1	
	OND/NCE	13	18.3	
	HND/BSc	47	66.2	
	MSc	1	1.4	
Income category	1,000,000 & below	19	26.8	
	1,000,001 – 2,500,000	17	23.9	
	2,500,001 – 5,000,000	22	31.0	4,819,718
	5,000,001 & above	13	18.3	

Mobile Phone Use

Figures 1 to 4 illustrate the use of mobile phones by the catfish farmers in the study area. Figure 1 shows that almost all (95.8%) of the fish farmers owned an Android phone, indicating that very few (4.2%) did not have a smartphone and instead used what is referred to in Nigeria as torchlight phones (phones that do not use 3G and lack the capabilities of an Android phone). This reflects a positive readiness on the part of the fish farmers to use technology, which can impact their productivity and improve their livelihoods. The presence of about a quarter of farmers using torchlight phones suggests that some farmers who own higher-end phones, such as Android, iPhone, and tablets, also possess a torchlight phone, a common practice among many Nigerians today. This result differs from the findings of Olaniyi and Ismaila (2016), who reported that 37.5% of farmers used smartphones while the remainder (62.5%) used basic phones (torchlight). This implies a shift in farmers' adoption of smartphones over the years.
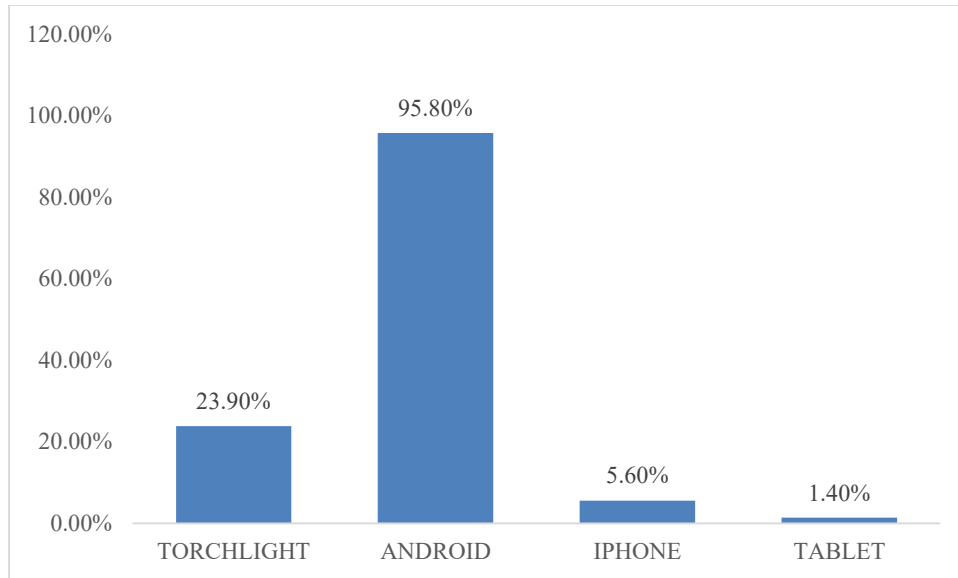
Fig 1: Phone type used

Figure 2 presents the type of network used. The majority (80.3%) of catfish farmers had access to a 4G network, which offers better internet connectivity and enables faster communication through various social media platforms. This can help catfish farmers reach other farmers, buyers, and feed suppliers more quickly and efficiently. Although the 5G network is slowly being adopted, a few (4.2%) of the farmers had access to 5G, which is superior but not yet widespread at the time of this study. This further indicates the farmers' readiness for technological use in their farming business and their capacity to adopt a wide range of applications, internet services, and digital agriculture.
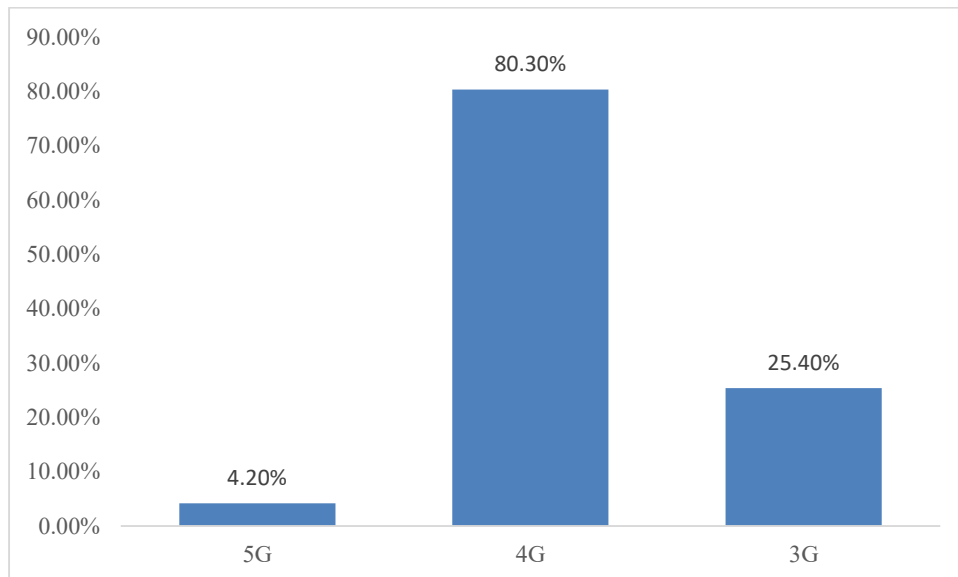

Fig 2: Network used

Figure 3 shows that the majority (87.3%) of catfish farmers used MTN for calls and data connectivity, as it was noted to have better network coverage in the study area. Additionally, 47.9% used GLO, and 32.4% used Airtel. This result indicates that digital agriculture is feasible at Uteh fish farming clusters since according to the Food and Agriculture Organisation [FAO], (2019), the full realisation of digital agriculture in fish farming in Nigeria is hindered by internet access and limited access to smartphones.
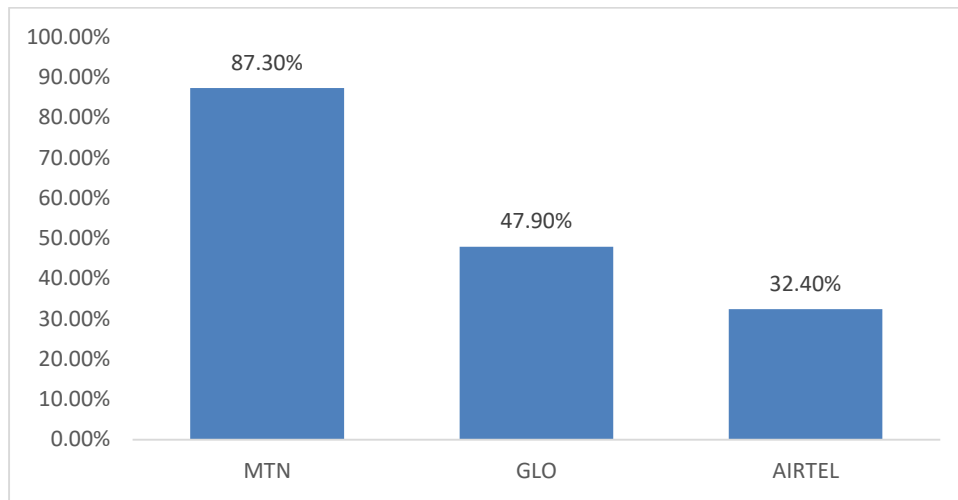

Fig 3: Network provider

Furthermore, all (100%) of the fish farmers used WhatsApp, as shown in Figure 4. They utilised social media, which is the latest method of communication for many people, both personally and professionally.
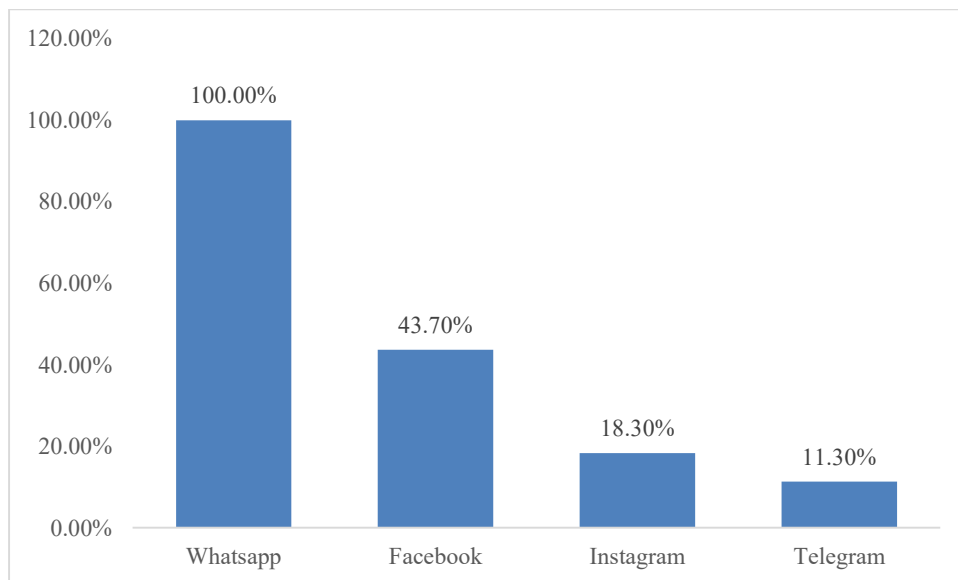

Fig 4: Social media used

Business Activities Carried Out Using Mobile Phone

The results in Table 2 show the type of catfish business activities mobile phone is used for. All (100%) of the fish farmers indicated that they used mobile phones for receiving calls and sending SMS, using social media apps such as WhatsApp, contacting buyers, and taking pictures for their business. These findings align with those of Ogunniyi and Ojebuyi (2016), who found that mobile phones were primarily used for basic functions like calling and sending SMS by farmers. However, the results also revealed that less than half of the catfish farmers used their phones to check the weather forecast, which supports the concerns raised by Ogbeide and Ele (2017) regarding the low use of mobile phones for obtaining weather information, a critical resource during adverse weather conditions. Additionally, only about one-fifth of the farmers used their mobile phones to apply for loans or utilise aquaculture-related apps. The results suggest that fish farmers are familiar with basic phone functions but may require training to utilise higher phone functions to address specific needs such as checking weather forecasts, obtaining loans, and using agricultural apps. This indicates areas where farmers may benefit from training to better leverage their mobile phones.

Table 2: Business activities carried out using mobile phone

Business activities	Freq	%
For sending and receiving SMS on business issues	71	100
For taking pictures for business purposes	71	100
Use social media such as WhatsApp, Facebook	71	100
To pay and receive money for your business	71	100
To contact buyers	70	99
For receiving calls for business issues	70	99
For making videos for business purposes	70	99
Ability to video call, voice call on social media apps	69	97
To learn things about your business	67	94
For promoting your produce on social media	66	93
To know market prices	65	92
To use voice recorder or make voice notes	65	93
Use mobile app for keeping records	60	85
To buy farm inputs	56	79
To check weather forecast	46	65
Use mobile app to apply for loans	20	28
Using aquaculture related apps	14	20

Farmer's Competence in the Use of Mobile Phones for Business Activities

The results in Table 3 show that farmers are competent in many uses of mobile phones for their business activities. They are most competent in paying and receiving money for business transactions (mean = 4.86) and in receiving calls related to business issues (mean = 4.82). They are also very skilled in taking pictures for business purposes (mean = 4.82) and in using social media platforms such as WhatsApp and Facebook (mean = 4.73). Other areas of competence include learning new things about their business with their mobile phones (mean = 4.46) and making voice notes (mean = 4.46). However, the farmers felt less competent in using their mobile phones to keep records (mean = 3.93), check weather forecasts (mean = 3.62), obtain loans (mean = 2.14), and use aquaculture-related apps (mean = 2.62).

Table 3: Perceived Competence of Farmers in The Use of Mobile Phones for Business Activities

Business activities	Likert Mean Score	Std. Deviation
For sending and receiving SMS on business issues	4.86	.389
To pay and receive money for your business	4.86	.389
For receiving calls for business issues	4.82	.487
For taking pictures for business purposes	4.82	.425
For making videos for business purposes	4.79	.476
To contact buyers	4.79	.445
Use social media such as WhatsApp, Facebook	4.73	.654
Ability to video call, voice call on social media apps	4.70	.595
For promoting your produce on social media	4.69	.667
To know market prices	4.49	.772
To use voice recorder or make voice notes	4.46	.859
To learn things about your business	4.46	.923
To buy farm inputs	4.27	.736
Use mobile app for keeping records	3.93	1.005
To check weather forecast	3.62	1.138
Using aquaculture related apps	2.62	1.200
Use mobile app to apply for loans	2.42	1.227

These findings indicate that while the catfish farmers are generally proficient with mobile phones for their business, certain services such as record-keeping and acquiring new information require more attention. This suggests that some level of digital illiteracy still exists among catfish farmers at the Uteh fish farming cluster, the largest in Edo State. This could hinder their ability to adapt and fully utilise digital solutions which according to The FAO (2019) reports

is a promising area with significant potential for growth. Ogunniyi and Ojebuyi (2016) found that fish farmers might be constrained from using some phone features and services that require higher literacy levels if they are not familiar with them. They also noted that farmers were unable to secure loans through their mobile phones.

Constraints Faced in Using Mobile Phones

Table 4 shows the constraints faced by farmers in the use of mobile phones at the Uteh Fish Farming Cluster in Benin City. The results reveal that the majority of farmers identified poor network coverage as their main challenge (67.6%). Ogunniyi and Ojebuyi (2016) also identified poor internet connectivity as a challenge faced by farmers in using their mobile phones. Fewer than 20% of farmers cited expensive data as a significant issue. Other complaints were minimal, such as difficulty in charging phones due to unreliable electricity supply (4.22%) and the high cost of mobile phones (4.22%). Constraints such as the complexity of using mobile phones (1.4%), fear of water damage (1.4%), storage issues with large records (1.4%), and problems with data loss or phone theft (1.4%) were not considered significant by the farmers.

These results imply that while electricity for charging phones, expensive data, and mobile devices are commonly regarded as major constraints to mobile phone usage (FAO (2019); Ogunniyi and Ojebuyi, 2016), in contrast, these were not viewed as serious issues by the Uteh fish farmers.

Table 4: Constraints Faced in Using Mobile Phone

Constraint	Frequency(f)	Percentage
Poor network coverage	48	67.60
Data is expensive	12	16.90
Unreliable Electricity supply for charging phone	3	4.22
Expensive Mobile phone	3	4.22
Mobile phone is difficult to use	1	1.40
Not everybody uses mobile phone	1	1.40
Fear of water contacting phone during usage	1	1.40
Loss of data when phone goes bad or stolen	1	1.40
Storage issue when records are large	1	1.40

Relationship Between The Socioecomic Characteristics of Fish Farmers and Their Perceived Competence in the Use of Mobile Phones

The relationship between the socioeconomic characteristics of fish farmers and their competence in the use of mobile phones was tested using Pearson Product Moment Correlation (PPMC) (table 5). The results show that age ($r = -0.326$, $p<0.01$) and highest education level ($r=0.243$, $p<0.05$) were associated with the perceived competence of the catfish farmers. The age of the respondents was negatively associated with their perceived competence suggesting an inverse relationship. That is, the higher the age of the catfish farmers, the lower their perceived competence in using mobile phones for business activities. The association between their highest education level and their perceived competence

was positive, suggesting that the higher their level of education the more competent they perceived themselves to be. These findings imply that age and education are critical factors in determining competence in phone usage among catfish farmers. Ifejika et al. (2017) also found a correlation between farmers' age and education level and their competence in using mobile phones for business activities. This suggests that younger catfish farmers and those with higher education levels are more likely to be competent in using mobile phones for their business. This is consistent with the findings of Ogbeide and Ele (2017), who reported a positive correlation between the age of aquaculture farmers and their educational status. Olaniyi and Ismaila (2016) similarly concluded that age and education level were significant factors influencing mobile phone usage among farmers in Oyo State.

Table 5: Association between the socioeconomic characteristics of fish farmers and their perceived competence in the use of mobile phones

Variables	Correlation Coefficient	Significant value
Age	-0.326	0.006*
Sex	0.039	0.744
Marital status	0.029	0.813
Highest educational level	0.243	0.041*
Yearly income	-0.128	0.288

CONCLUSION

Findings from the study revealed that fish farmers were competent in using mobile phones for basic business activities but are not familiar with phone features and services that require higher digital literacy and therefore will require training to improve the phone use capacity. The study also indicates that the age and educational level of the catfish farmers are critical factors associated with their competence in using mobile phones for business activities. These are therefore important to consider in implementing any digital agriculture solutions for catfish farmers.

CONFLICT OF INTEREST

The Authors have no conflict of interest.

ACKNOWLEDGEMENT

REFERENCES

Adisa, T., Ibrahim, G., Angarawai, I. I., & Daudu, K. (2018). Mobile phone use and farmers' welfare: Conceptual and analytical framework. *Journal of Agriculture and Rural Development in the Tropics and Subtropics*, *119*(1), 93-103.

Barrman, B. K., & Little, D. C., (2006). Nile Tilapia (Oreochromis niloticus) seed production in irrigated rice-fields in Northwest Bangledesh – an approach appropriate for poorer farmers? *Aquaculture*, **261** (1): 72-795. Doi:10.1016/j.aquaculture.2006.06.018

Ifejika, P. I., Oladosu, I. O., Ifejika, L. I., Asadu, A. N., & Laniran, P. T. (2017). Study of Mobile Phone Gratification Sought and Obtained by Aquaculture Farmers as Strategy for Advisory Services in Nigeria. *International Journal of Environment, Agriculture and Biotechnology*, **2**(2): 616–623. https://doi.org/10.22161/ijeab/2.2.8

Food and Agriculture Organization. (2019). *Digital technologies in agriculture and rural areas* [Briefing paper]. FAO. https://openknowledge.fao.org/server/api/core/bitstreams/885161de-dccf-4589-8376-07fe37b68799/content

Kaleem, O. & Sabi, A. F. B. S. (2021). Overview of aquaculture systems in Egypt and Nigeria, prospects, potentials, and constraints. *Aquaculture and Fisheries,* **6***:* 535-547.

Ogbeide, O. A., & Ele, I. (2017). An Analysis of Mobile Phone Use in Nigerian Agricultural Development: *International Journal of ICT Research in Africa and the Middle East*, **6**(2): 29–46. https://doi.org/10.4018/IJICTRAME.2017070103

Ogunniyi, M. D., & Ojebuyi, B. R. (2016). Mobile Phone Use for Agribusiness by Farmers in Southwest Nigeria. *Journal of Agricultural Extension*, **20**(2): 172. https://doi.org/10.4314/jae.v20i2.13

Olaniyi, O.A., & Ismaila, O.A. (2016). Assessment of the Usage of Mobile Phones as a Tool for Information Dissemination among Farmers in Oyo State, Nigeria. *Journal of Agricultural Extension,* **20**(2): 105-117.

Shirajee, S. (2013). The Changing Face of Women for Small-Scale Aquaculture Development in Rural Bangledesh. *Sustainable Aquaculture* **15**(2): 9-16.