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Challenges facing semi-urban fish farmers' use of information and communication technology devices in Imo State Nigeria

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ABSTRACT

The study examined the challenges semi-urban fish farmers face in their use of information and communication technology devices in Imo state. Data were obtained using structured questionnaire from 210 fish farmers selected randomly from a list of 2300 fish farmers obtained from fish farmers cooperative office in Owerri, the state capital. Using descriptive statistical tools, data were analyzed and presented in tables for understanding and clarity. Results revealed that majority (37.6%) are within the active age of 41-50, 58.6% are males, 50% have secondary education, and have about 11-15 years of fish farming. The respondents have frequent access to radio, telephone (mobile), television, magazines and newspapers. They need information on feed formulation, water management, disease management, fingerlings, processing and drug use. They face the following challenging erratic power supply, low level of education, language barrier, low income, lack of skills in ICT, among others. In view of the following we recommend that communication companies and service providers improve their network coverage. Government should also improve in their provision of electricity and make power supply constant and steady.

1. Introduction

Information Communication Technology (ICT) is revolutionizing the world and this has a huge socio-economic implication for mankind. At the end of the 20th century, people in rural and remote areas of developing countries are facing many unprecedented challenges brought on by the changing global economy, dynamic political contexts, environmental degradation and demographic pressures (Ndati and Okumu, 2014). The number of food insecurity around the world continues to increase. To deal with these challenges, and to make critical decisions, people at all levels of society, and especially the food insecure and the organizations that serve and represent them, must be able to access critical information and communicate. Improved communication and information access are directly related to social and economic development (World Bank, 1995).

Generally, agriculture is an information-intensive industry. The sector draws upon infinite sources of widely dispersed, locally contextualized knowledge and a considerable body of research materials. It relies upon continuous flow of information from local, regional and world markets (Rutger, 2000). It involves such sub-sectors as fish farming, crop production and livestock rearing. Fish farming has become a common practice to increase income of practitioners and in the process reduce the wage bill expended on fish importation. Fish farmers thus need information to optimize production. Due to the growing population of fish farmers, different kinds of information are being made available to those interested, particularly on how to start fish farming, management of fish farming and what to do when one is at a cross road (Akinbili and Alabi, 2010). Seminars and workshops are often organized to enlighten and educate people on fish farming management practices. Information and communication technologies are also being used in information dissemination on the subject matter. All these are to encourage local participation so as to increase rate of production.

Information as a factor of production is necessary to increase productivity. It has been established that poverty in Nigeria has a strong linkage with agricultural stagnation due to decline in productivity as a result of low use of information and improved technologies (FAO, 1999). The right to information becomes as fundamental as the right to food, shelter and employment. Hence, information is seen as a factor of production for which fish farmers may be willing and prepared to pay. As reported by Meyer (2005), information plays an important role in almost every human activity and its value in the development process has been a topic of extensive debate. Lack of information has impacted negatively on the development process. Information should also be seen as being tangible, physical and concrete to fish farmers, most especially through extension services. Arokoyo (2003) revealed that the village level extension agent is the most effective source of information for farmers but certainly not the most efficient in terms of cost and coverage.

Fisheries offer a key entry point to reach millions of poor people of Africa, including Nigeria to assist in increasing people's income, improving the nutrition and health of families and becoming active agents of economic development and social change (Bene and Hecks, 2005). Ifejika, Akinbile, Ifejika and Oladeji (2008) notes that experience confirmed the positive impact of aquaculture in countries like China, Vietnam, Philipines, Bangladesh and India. Ayodele and Ajani (1999) reported that fish farming is now producing half of the fish produced in Nigeria; while Akinyemi (1998) highlighted the cost effectiveness of fish farming in meeting the demand for fish in the country rather than depending on fish imports. Nigeria is reported to have aquaculture potential which constitutes 75% of 923,768km2 of the landmass and 14 million hectares of inland freshwater, but less than 1% is utilized for fish production (Ugwumba and Ugwumba, 2003; (FAO, 2005). The report further reveals that aquaculture is dwarfed by fish importation, an indication of poor exploitation of aquaculture resources

capable of producing over 3 million tonnes of fish to meet domestic demand and excess for export (Ifejika et al, 2008). Thus, despite the wide acceptance of fish farming as an income generating activity, its contribution to total domestic fish production in the country has not met the target (Akinyemi, 1998). This is basically due to lack of technological know-how by fish farmers and prospective entrepreneurs.

The use of aquaculture technologies to strengthen production has proven potentials to revising the trend of fish importation. Applying proven technologies will increase production of small-scale operators that constitute 80% of global fish farmers (New Partnership for African Development (NEPAD), 2005; Gupta, 2006). Information on improved aquaculture technologies and its resultant effect on productivity and income of fish farmers need to be investigated. The search for an effective strategy for agricultural development calls for adequate use and application of ICTs, especially computers and the Internet, which are considered as among the principal drivers of economic growth and development worldwide (Abubakar and Abdulahi, 2009). Emphasis is being placed on the

use of ICTs in boosting agricultural production among farmers. Farmers who are hooked up to new technologies fare better (Adejo and Haruna, 2009).

ICT plays essential role inpoverty alleviation by providing powerful tool to rural farmers and other citizens to grow their business and create new opportunities and delivery of services to rural areas. Fish farmers need information to enhance agricultural management, research and development (Nkwocha, Ibeawuchi, Chukwueke, Azubuike and Nkwocha, 2009). ICTs promote access to and sharing of information in agriculture and allied fields. ICTs include the use of radio, television and computer/Internet, global system of mobile telecommunication (GSM) and the other fixed telephone network, fax etc. Using information is a key issue in the information age. The real challenge of our time is not producing information or storing information, but getting people to use information (Gholamreza and Naser, 2005). Timely availability of relevant information is vital for effective performance of fish farmers.

The enhancement of local fish production can be brought about by improving capacity in terms of enhancing access to information, while also the technical nature of fish farming requires that the knowledge of practitioners are constantly updated which can be achieved through their enhanced information seeking behavior by the use of ICTs. It thus becomes important to find out how use of ICTs affects fish farmers' production. Thus, the extent to which fish farmers use ICTs are ex-rayed so as to know how that affects their level of production. It is against this backdrop that this study addressed the following research objectives:

The general objective of the study is to ascertain challenges facing semi-urban fish farmers' use of ICT devices in Imo State. The specific objectives are to; i) describe the socio - economic characteristics of fish farmers; ii) identify ICT devices available to fish farmers; iii) identify information needs of fish farmers; (iv) examine challenges facing fish farmers use of ICT devices.

2. Materials and methods

The study was carried in Imo state. Imo State lies within latitudes 4°45'N and 7°15'N, and longitude 6°50'E and 7°25'E with an area of around 5,100 sq km (IMSG, 2010). It is bordered by Abia State on the East, by the River Niger and Delta State on the west, by Anambra State to the north and Rivers State to the south. The state is rich in natural resources including crude oil, natural gas and others (IMSG, 2010). However with a high population density and over farming the soil has been degraded and much of the native vegetation has disappeared. This deforestation has triggered soil erosion which is compounded by heavy seasonal rainfall that has led to the destruction of houses and roads. The rainy season begins in April and lasts until October with annual rainfall varying from 1,500mm to 2,200mm (60 to 80 inches). An average annual temperature above 20 °C (68.0 °F) creates an annual relative humidity of 75%. With humidity reaching 90% in the rainy season. The dry season experiences two months of Harmattan from late December to late February. The hottest months are between January and March. The estimated population is 4.8 million and the population density varies from 230-1,400 people per square kilometre. Imo state is a predominantly Igbo speaking state, with Igbo people constituting a majority of 98% of the inhabitants. The population for the study comprised all the semi - urban fish farmers in Imo state. The three agricultural zones, Owerri, Orlur and Okigwe were purposively sampled for adequate coverage. A list of the adjourning local area councils, undergoing transition to urban, inhabiting the fringe of the urban council and supplying food to the urban market was completed by the researcher. Three area councils were selected from each zone: Owerri West, Owerri North and Mbaitolu were sampled from Owerri Agricultural Zone. Orlu, Orsu and Njaba were sampled from Orlu zone, Onuimo, Okigwe and Ihitte-Uboma were sampled from Okigwe zone. The list of all the fish farmers who are registered with various cooperatives was obtained from the resident extension agents. From the list totaling 2100 fish farmers, a simple size of 210 fish farmers was proportionately sampled to provide information for the semi-urban fish farmers in the study. Data were collected using structured questionnaire. Objectives 1 and 4 were analyzed descriptively using percentages presented in tables. Objective 2 was achieved on a 4 point likert scale type of very often, often, seldom and never assigned scores of 4,3,2,and 1. The scores were added and divided by 4 to give 2.50. Any mean score 2.50 and above was accepted as very often, while mean less than 2.50 was not accepted. Objective 3 was also achieved on a 4 point liker scale type of highly needed, moderately needed, needed and not needed assigned scores of 4,3,2 and 1 – the score were added divided by 4 to give 2.50. The decision was also as stated in Objective 3.

3. Results and discussion

3.1. Socioeconomic characteristics of responding fish farmers

Table 1 reveals the socioeconomic attributes of the respondents. Age as shown in that table reveals majority (37.6%) are within the age bracket of 41-50 years. They are followed by 26.7% who are within the age of 51-60 years. This implies that majority are in their middle age. They have the ability to engage in fish farming and search for relevant information required to do well in their fishing business. The males constitute about 58% while the females make 41.4% of the respondents. This reveals the dominance of the male folk in agriculture and related business as owners of land and as family heads who take decisions for the family. Also, 62.8% are mareried individuals who live with their family members. They are followed by 25.7% who are widows. Again, greater percentage (50% attended secondary school, 23.3 attended primary school, while 20.9% attended tertiary education. This tells why the fish farmers are information conscious and can manipulate ICT devices. They cannot be called illiterates as a result. Majority (48.5%) have 1-6 persons as their dependents, 44.3% have between 7-12 people. This implies that fish farming is a family business as they provide ready labour when ever the need arises.

Table 1
Socioeconomic characteristics of respondents.

Characteristics	Frequency	Percentage
Age		
21-30	18	8.5
31-40	34	16.2
41-50	79	37.6
51-60	59	26.7
61 & above	23	10.9
Sex		
Male	123	58.6
Female	87	41.4
Marital status		
Single	24	11.4
Married	123	62.8
Widow	54	25.7
Education level		
Adult education	12	5.7
Primary	49	23.3
Secondary	10.5	50.0
Tertiary	44	20.9
Household size		
1-6	102	48.5
7-12	93	44.3
12 & above	15	7.1
Fish farming experience		
1-5	15	7.1
6-10	35	16.6
11-15	54	25.7
16-20	43	20.4
21 % above	63	30.0
Pond size		
Large	135	64.2
Small	75	35.7
Number of ponds		
1	60	23.8
2	87	41.4
3	63	30
4 and above	10	4.7

Majority of the respondents (64.2%) have large ponds that they manage, while 35.7% have small ponds in their farms. Again, 41.4% have 2 ponds in their enclosures, 30% have about 3 ponds, 23.8% have 1 pond only. The above size of ponds and number of ponds determines the farmers (fish) scale of operation. More ponds will guarantee business all year round and encourages the farmer to be up and doing as well.

3.2. Frequency of access to ICT devices

Table 2 shows how frequency or often the fish farmers access ICT devices. The noise frequently accessed devices are radio with mean response of 3.27, mobile phone (x = 3.30) magazine (x = 3.02) newspaper (x = 3.0), television (x = 2.51) other devisers accessed but not frequently are internet (x = 2.27), email (x 1.54), CD Rom (x = 1.26), and fax (x – 1.07).

The implication of the above is that local radio can be an effective tool in community building, particularly for those who live in rural and sparsely populated areas. It has also proven effective at disseminating information about livelihoods (market prices, weather forecasts) healthcare, education and potential disasters. There are cases where radio is used primarily for information dissemination applications, but is funded primarily through personal announcements such as birth and death notices. Although more costly to implement and less accessible to the poor, television can have similar characteristics. Radio targeted at female listeners seems to be an effective way to reach this population that may have little access to other communications channels.

It has been estimated that even in the poorest areas, people willingly spend several dollars per month on personal communications. Examples include talking to family in local cities or foreign countries, calls about remittances and making appointments for medical care or government interactions. It has varyingly been reported that the ability to place a phone call can either avoid a time-consuming and potentially risky trip to the city, or by scheduling appointments, make the trip more effective. All of these benefits can improve quality of life, reduce costs and reduce time spent away from food- or income-producing activities. In areas where telephone service is available, studies have shown that a large percentage of the population will make a call regularly.

Table 2
Frequency of access to ICT devices.

ICT Devices	Very often	Quite often	Seldom	Never	Mean
Radio	98	81	21	10	3.27
Television	50	37	94	29	2.51
Mobile phone	110	65	24	11	3.30
Internet	25	36	120	29	2.27
Computer	10	25	35	140	1.54
e-mail	15	25	55	115	1.69
CD-Rom	5	10	21	174	1.26
Magazines	73	87	31	19	3.02
Newspaper	54	119	28	9	3.0
Fax	1	4	4	201	1.07

3.3. Information needs of fish farmers

Table 3 reveals that the respondents highly need information on almost all the important areas of fish farming. They need information highly on feeds/ feed formulation which mean response of 2.96, pest and diseases management (X= 2.88) credit facilities, (x=2.84) fish farming equipment (x=2.52), dugs for disease control ($X = 2.97$), fingerlings ($X = 3.01$), fish storage ($X = 26$) marketing of fish ($X = 3.03$), processing (X=2.58), water management (x=3.02), information is needed but not highly on record keeping (X=2.10), pored construction (X=2.30) and brood stock selection (X=2.3).

3.4. Challenges of ICT use by semi – urban fish farmers

Fish farmers in the study area face myriads of challenges in their use of ICT facilities for the farming business. Table 4 reveals that low level of income of farmers with 95.2% response and erratic power supply are the major challenges faced by fish farmers. Low level of education (93.3%), language barrier (90.4%), high cost the of ICT facilities/ devices (88.19%), inadequate time for the farmers (84.7%), lack of ICT skills (74.7%) are all challenges fish

farmers face. Other challenges are lack of exposure to ICT facilities (74.3%), age limit of farmers (61.9%), poor network coverage (71.4%), fear and suspicion (46.7%), lack of durability of devices (50%), lack of training in ICT (40.9%) and ICT maintenance (36.1%).

Nigeria has been named one of the telecommunications markets with the most promising potential for growth. Even so, the National Communications Commission has identified several issues as detrimental to this growth, including poor public power supply, poor security, and high operational costs (Onuzuruike 2009). Gupta and Sullivan (2010) found unreliable electricity and insecurity to be the main challenges to operating mobile networks. These challenges were much more prominent in Nigeria compared to other West African countries with more reliable access to the electricity grid (such as Ghana, Cameroon, and Côte d'Ivoire). Gupta and Sullivan (2010) calculated that costs of fuel for generators, including a minimum of 20 percent of fuel lost to theft, amounted to 60–90 percent of the costs of running network sites in Nigeria. Base station costs in Nigeria add up to US$ 200,000–250,000, 3.5 times higher than in India (US$ 60,000–70,000). Some of these limitations are at last being overcome through passive infrastructure sharing.

In a study on ICT roles for poverty reduction among urban poor in Zimbabwe, (Bowora and Chazovachii, 2010) revealed that the respondents in the informal sector bracket lacked the knowledge and exposure to ICTs other than cell phones, radios and televisions. Most informal traders did not appreciate this and hence for them there was an immediate need to own the other ICTs. This research has revealed that men generally were more knowledgeable about ICTs. This can be explained by the low literacy rates amongst women, propelled by the vicious cycles of poverty. Women are more concerned about family issues that are domestic in nature. Another limiting factor is their financial status which constrains them from owning even a cell phone. The only cell phone in the family will be owned by the man, who is the household head. This can only be linked to the cultural values which tend to stereotype women and have less opportunity in terms of education hence being less informed. Most women who are housewives whose education was negated by our cultural values which were oppressive to the girl child lacked interest and knowledge of ICTs. This was mainly common to women of the age of 40 and above. The younger generation understood better about ICTs since more opportunities are now offered to them in schools and colleges without looking at gender.

Table 3
Information needs of fish farmers.

Information Need	HGN	MDN	NDD	NTD	MEAN
Feeds /food formulation	80	65	43	22	2.96
Disease/ pest management	50	94	38	28	2.88
Credit facilities	73	44	80	13	2.84
Equipment	43	58	76	33	2.52
Drugs	80	64	47	19	2.97
Fingerlings	74	80	40	16	3.01
Storage	40	67	84	19	2.60
Marketing	70	83	50	7	3.03
Processing	44	57	89	22	2.58
Water management	82	63	54	11	3.02
Blood stock selection	35	43	83	49	2.31
Record keeping	38	12	93	67	2.10
Pond constrictions	42	30	87	51	2.30

HGN = Highly needed, MDN = Moderately needed. NDD – Needed, NTD = Not needed.

4. Conclusion

Fish farmers use ICT devices in the study area for information sourcing and communication. But they are not benefiting fully from the use of devices due to numerous challenges facing. These limit them from realizing the full benefits of using ICT. Education and training should be given to the fish farmers on ICT skills, training and government and state holders should work toward provision of constant power supply and improving network coverage and connectivity.

Table 4
Challenges of ICT used by fish farmers

Challenges	Percentage	Rank
Emetic power supply	95.7	1st
Lour level of education	93.3	3nd
Language burners	90.4	4rd
Lack of ICT skills	74.7	7th
Unavailability of ICT contras	69.1	10th
Low income of farmers	95.2	1st
Cost of ICT facilities	88.1	5th
Inadequate time of farmers	84.7	6th
Lack of exposure to ICT facilities	74.3	8th
Age limit of farmers	61.9	11th
Problems associated with ICT ma-----	36.1	16th
Lack of ICT training	40.9	15th
Poor network coverage	71.4	9th
Fear and suspicion among villages	46.7	13th
Lack of curability of some ICT devices	50.0	12th
Lack of service shops in area	42.8	14th

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