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Spring 7-10-2015

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chikaire, jonadab ubochioma mr, "Analysis of Information and Communication Technology Roles in Poverty Reduction Among Small and Medium Scale Farmers in Imo State, Nigeria" (2015). *Library Philosophy and Practice (e-journal)*. 1284.

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**Analysis of Information and Communication Technology Roles in Poverty Reduction
Among Small and Medium Scale Farmers in Imo State, Nigeria.**

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Abstract

This study examines the role ICTs play in poverty reduction among small and medium scale (SMS) farmers in Imo State, Nigeria. Data were collected from 170 (SMS) farmers in Imo State using well structured questionnaire. Analysis of data collected was done using percentages and mean presented in tabular forms. It was seen from results that 38.2% of the respondents are within the age bracket of 51-60 years. Majority (43.5%) attended secondary school, 48% have put in 11-20 years in farming, while 71.7% have a farm size 0.25-1.5 hectares. ICT devices used include radio, mobile phones, television, among others. On frequency of use of ICT devices, radio is the most frequently used as indicated on a daily basis. They also use telephone, magazines and newspapers. ICTs play veritable roles such as increasing access to education, health information, information on diseases/pest outbreak, market information employment generation, credit opportunities among other. Social amenities be provided by government so that small and medium scale farmers wii have unlimited access to other modern ICT facilities.

Key words: Poverty, small scale, medium scale, ICTs, farmers

Introduction

Poverty is the opposite of wellbeing. Beyond lack of income, multidimensional concept of poverty also refers to disadvantages in access to land, credit and services (e.g. health, and services), vulnerability (towards violence, external economic shock, and natural disaster), powerlessness and social exclusion. The World Bank report for 2000/2001 uses the standard of one US dollar per day to draw the line of extreme /absolute poverty considering that we have about 1.3 billion people around the world in poverty circle (Cecchini and Scott, 2003). Using Nigeria as a case study and considering the inflation rates between year 2000 & 2011, one can then put the assertion in the report at average of 5 dollars per day. If that should be the case then we may have above 80% of Nigerian living below poverty line and this could have negative effect on the economic growth of the nation (Yekini et al., 2012).

Modern approaches to poverty go beyond World Bank report of 2000/2001 because reliance on income terms alone misses many facet of the everyday life of the poor and therefore unsatisfactory. Therefore poverty is not only restricted to material deprivation, but encompasses intangible aspects, such as lack access to schooling, healthcare, vulnerability towards external events or being excluded from decision making processes.

Poverty stems from a situation where gross inequality of assets persist because of vested interests and entrenched power structures Market can provoke collusions that blocked the potentials benefits of competition to the poor, and the disadvantaged can easily fall outside distributional coalition. At national and at local levels economic gains may be captured by elites that may form patronage and clientele networks for the redistribution of benefits. Lack of good governance and inequality legislation or its enforcement may further reinforce such capture (Oye, 2012). Poor people often lack essential assets such as good productive resources and capital. Their employment situation is insecure, and their incomes seasonal and meager. They live in remote, unhygienic and resources-poor areas, in distant villages and in appalling slums. Their poverty results from lack of social safety nets, and discrimination. They also suffer from poor government services and corruption. Assistance may also not reach them because of the lack of the political will, poor governance and corruption, and inappropriate public policies and programmes.

Poverty is a state where individual is not able to cater adequately for his/her basic need of food, clothing and shelter, unable to meet social and economic obligations, lack of gainful employment skills, asset and self esteem and has limited access to social, economic infrastructure, such as education, health, portable water and sanitation and as a result has limited chance of advancing his or her welfare to the limit of his/her capabilities. Poor people can also be found in both urban and rural areas though the incidence of poverty is much higher in the rural areas than in urban areas. Rural poverty is common among small-scale farmers and self employed artisan and petty traders (Oye, 2012). There are two categories of rural poor: (a) those who do not own enough farmland for subsistence farming and (b) landless agricultural laborers and other non-agricultural groups who rely on employment opportunities in the rural areas. As for the farmers, the unequal distribution of land is the principal causes of their poverty while the latter poverty consists of not only low agricultural wages but shortage of unemployment opportunities.

Agriculture is a major component of Nigeria's economic life, with crop and livestock constituting an integral part. Crop and livestock farming contribute immensely to the livelihood in urban and rural communities through increased food production, farm energy, manure, fuel, transportation and nutritional security and incomes (Tewe, 1997). Like most sectors, agriculture is an information intensive business, and ICT could play crucial roles in facilitating information exchange ((Todaro, 2000). The role of information could be visualized from the perspective of development, flow and management of information and ideas in the various links in the system of livestock farming namely input/procurement, production, marketing, sales and health management issues.

Information and communication technologies (ICT) play inevitable roles in every aspect of human activities today, including agriculture. The key players in agriculture are the farmers, and their ability to use the technologies defines the role of ICT in agriculture generally (Nwagwu and Opeyemi, 2015). ICT use by farmers is now on the increase globally. In increasing access and exchanging of information, ICT offer the potential to increase efficiency, productivity, competitiveness and growth in various aspects of agricultural sector. Farmers that engage in commercial agriculture in large scale might be expected to be using cameras, computing devices, digital imaging, the Internet and Wide Area Networking (WAN), Wi-Fi, SMS services, WAP (Wireless Access Protocol) based Internet access using cellular telephony, and digital media and DVD, among others (Nwagwu and Opeyemi, 2015). Those that engage in agriculture in small scale utilize various other forms of ICT such as mobile phones, computers, and the internet, etc.

Of all technologies, the mobile phone is certainly an instrument of choice for many farmers, both large and small scale. Mobile phones are cheap, easy to manage, power efficient and encourages personalized interactions. Mobile phones enable farmers to compare prices more efficiently and to link up with other buyers who were not previously easily accessible. Mobile phone helps to improve the links between farmers and traders, creating opportunities for small-scale producers to sell to new markets, thereby increasing their incomes and helping to reduce poverty in the area. ICT use in agriculture in Nigeria is still evolving, just like in many developing areas (Nwagwu and Opeyemi, 2015). There is some evidence of application at individual levels as well as initiatives at organizational level. However, it is relatively unknown whether the ultimate beneficiaries – the farmers themselves- actually use the facilities to meet their needs. The major problems in adoption of ICT in rural settings are ICT illiteracy, availability of relevant and localized contents in own languages, easy and affordable accessibility and awareness and willingness to adopt new technologies.

The potential benefits of ICT to farmers and farm processes call for need to understand factors that might influence the use of the technologies by farmers. Similar studies exist ((Kiplang'at, 1999; Heeks, 1999; Bayes, 2001; Dao, 2004), but there is none in Imo State, an agrarian state with large number of small and medium scale farmers. In developing countries as is the case of Nigeria, small-scale farmers dominate the agricultural economy (Afolabi, 2010). Over 80 percent of the farming population in Nigeria are small holders residing mostly in rural areas. Anaman (1988) disclosed that small farms are mainly responsible for self sufficiency of food in Africa and cultivation of export crops. They are also very significant in world development with 50% of world's population depending on them.

In a survey carried out in 1973/74 by the Federal Office of statistics as reported by Olayide (1980), the small-scale farms were classified to range between 0.1ha and 5.99ha and they constitute about 80.78% of all farm holdings, the medium scale farms range from 6.0 to 9.99ha and constituted about 13.59 % of all farm holdings while large farms range from 10.0ha and above and constituted about 5.63% of all farm holdings. This study therefore seek to achieve the following objectives: to describe the socio-economic characteristics of small scale farmers in the study area; identify small scale farmers agricultural information needs in the area; to ascertain frequency of use of ICT devices by small scale farmers in the area; and to examine ICT roles in poverty reduction among respondents in the study area.

Methodology

The study was carried out in Imo state, Nigeria. 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. 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 economically exploitable flora like the iroko, mahogany, obeche, bamboo, rubber tree and oil palm predominate. 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). The state has an average annual temperature above 20 °C (68.0 °F) with an annual relative humidity of 75%, 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 kilometer. The population of the study comprised all small and medium scale (SMS) farmers in the area who have a holding of 1 – 10 hectares of farmland who belong to registered cooperatives. Multi stage sampling technique was employed in selecting sample for the study. The first stage involved the selection of three agricultural zones in the state, namely, Owerri, Orlu and Okigwe Agricultural zones. The second stage involved the selection of three (3) area councils from each zone making nine (9) area councils. The third stage involved the selection of two cooperatives each from the nine local area councils making 18 cooperatives. A list of registered small and medium scale (SMS) farmers was obtained from the Zonal cooperative offices in Orlu, Owerri and Okigwe. The

lists contained a total of 1750 registered members. Out of this, a random sample of 170 members was selected for the study. Well structured questionnaire was used to elicit information from the respondents. Data were analyzed descriptively. Objective 1 – 3 were achieved using percentages, while objective 4 was achieved on a 4 point likert – scale measurement of strongly agree, agree, disagree and strongly disagreed assigned a weight of 4,3,2 and 1. The weight was added and divided by 4 to give 2.50. And mean 2.50 and above was regarded as positive, while mean less than 2.50 was not regarded as positive.

Results and Discussions

Socioeconomic characteristics of respondents

Table 1 shows the socioeconomic variables of the respondents. Majority of the respondents (38.28) are within the age range of 51-60 years. They are followed by 31.2% who are within the age of 41-50 years. This implies that they respondents are active and have the ability to perform farm operations. Again, 43.5% have secondary education, 30% have primary education, with 18.8% attending tertiary education. On marital status, 64.7% are married, 15.8% are widows, majority (71.7%) have small size of 0.25 – 15 hectares of land. The table also shows that 51.2% have 1 -4 dependents, 31.7% have 5-8 people in the families. On farming experience, 48.8% have put in 11-20 years, 31.2% have 1-10 years farming experience. They belong to various organizations as indicated by 82.3% of the respondents. The implication of household size to farming is not far-fetched because, family members provide ready labour for agriculture. Farming experience of a farmer tells his knowledge of the topic under study as the information the farmers give will be correct and reliable based on their many years in farming business.

Table1: Socioeconomic Characteristics of Semi-Urban Famers

CONSTRUCT	FREQUENCY	PERCENTAGE
Age		
31 – 40	21	12.4
41- 50	53	31.2
51 -60	65	38.2
61 and above	31	18.2
Education		
No formal education	13	7.6
Primary	51	30
Secondary	74	43.5
Marital status		
Single	18	10.6
Married	110	64.7
Widow	27	15.8
Farm Size		
0.25-15	122	71.7
1-12	35	20.6
2-3	9	5.3
3 and above	4	2.4
Household Size		
1-4	87	51.2
5-8	54	31.7
9 and above	29	17.1
Faming Experience (years)		
1-10	53	31.2
11 -20	83	48.8
21 and above	34	20
Organization Membership		
Yes	145	82.3
No	25	14.7

Small and medium scale Farmers' Agricultural Information Needs

As far as food production is concerned, farmers need vital information to increase and improve productivity. Table 2 shows that farmers need information on seeds and planting materials and credit facilities with (97.1%) each, weather information (82.3%), soil and water conservation (62.1%), diseases/pest control (75.3%), manure/fertilizer use (90.3%), weeding /harvesting time (84.7%), credit facilities (97.1%), loans/ advances (67.5%), product planning (85.3%), market information (80.6%), crop storage (88.2%), and extension training of farmers (87.7%).

Table 2: Information Needs of Small and Medium Scale Farmers

Information Area	Frequency	Percentage
Seeds/planting materials	165	97.1
Weather information	140	82.3
Soil/water conservation	107	62.9
Diseases/pest control	128	75.3
Manure/fertilizer use	154	90.5
Weeding/harvesting time	120	84.7
Credit facilities	165	97.1
Loans/ advances	115	67.5
Product planning	145	85.3
Market information	137	80.6
Storage of crop	150	88.2
Extension training	148	87.1

Frequency of Use of ICT Facilities

Radio is the most frequently used information and communication technology device as indicated by 94.1% daily usage by the respondents. The second frequently used ICT device is mobile phone with a daily usage response of 88.2%. Television is also used by the

respondents as shown by 67.6% response. The newspaper (41.2%) is also used daily by the respondents. The respondents also use computers monthly as shown by 44.1%, internet has the highest monthly usage of 84.1%, video is also used monthly (60.5%) by the respondents. For CD-ROM, the respondents usage is also monthly as shown by 82.9% respond. The result shows that radio is unique in that it is relatively inexpensive to set up, it is estimated that more than 50% of all households (SIDA, 2005) in developing countries have ready access to radio receivers, receiving broadcasts does not require literacy, and it can use indigenous languages even if the population served is small, this accounts for its usefulness on a regular basis.

Table 3: Frequency of Use of ICT Facilities

Facilities	Daily	Weekly	Monthly mean
Radio	Daily (94.1)	6 (3.5)	4 (2.3)
Television	105 (67.6)	(17.6)	25(qa)
Computer	30 (17.6)	65 (38.2)	25 (14.7)
Internet	5 (2.9)	22 (12.g)	143 (841)
Telephone	150 (88.2)	15 (8.5)	5 (2.g)
Fax	0 (0)	0(0)	0(0)
Video	47 (27.6)	20 (11.7)	103 (60.5)
Newspaper	70 (41.2)	45 (26.4)	55 (32.3)
Magazines	55 (32.3)	95 (55.8)	20 (11.7)
CD-ROM	15 (8.8)	24 (141)	141 (82g)

Perceived Roles of ICT on Poverty Reduction

Information and communication technology devices are a component of meaningful socioeconomic development. They play veritable roles in the overall development, welfare and livelihood of the people. Table 4 reveals that ICTs have the potential of increasing access to education, via the plat form for literacy programmes, as shown by a mean response of 3.21. Respondents also get health information and medi-care tips from ICT use ($x = 3.12$). Others roles of ICT in poverty reduction include: monitoring of pest/diseases outbreaks ($x=2.47$), provision of agricultural information on input ($x = 3.38$), early warning information provisioning ($x=3.24$) information on market prices and access to market opportunity with mean 3.48 and 3.36 respectively. There are also the reduction in cost of business transaction

($x = 3.36$), creation of employment ($x=3.01$), improves services delivery ($x=3.18$), transparency accountability ($x=3.02$), increase productivity of farmers ($x=2.98$), micro-credit opportunities ($x=3.04$), alters farmers on disaster ($x = 2.86$), reduces drudgery ($x=3.08$), enhances production plan/decision making of farmers ($x=2.76$), improves bargaining power of farmers ($x=2.88$), and reduction of social isolation ($x=3.05$).

In some instances, access to mobile phones has been associated with increased agricultural income. A World Bank study conducted in the Philippines found strong evidence that purchasing a mobile phone is associated with higher growth rates of incomes, in the range of 11–17 percent, as measured through consumption behavior (Labonne and Chase 2009). One reason for this finding is that farmers equipped with information have a stronger bargaining position within existing trade relationships, in addition to being able to seek out other markets. A study of farmers who purchased mobile phones in Morocco found that average income increased by nearly 21 percent (Ilahiane 2007). Mobile phones can serve as the backbone for early warning systems to mitigate agricultural risks and safeguard agricultural incomes. In Turkey, local weather forecasts transmitted through SMS provided very timely warnings of impending frosts or conditions that favored pests. Mobile platforms may also have potential for enabling rural people to find employment.

Transaction costs are present throughout agricultural value chains, from initial decisions about whether and what to plant, to all of the operations during the growing cycle, harvesting, postharvest and processing operations, and selling (to intermediaries, consumers, processors, exporters). These costs can account for a large share of the cost of a farm enterprise. Mobile phones may help users to substitute phone calls for travel. Where safety standards are minimal, roads are in disrepair, and distances are great, substituting phone calls for travel reduces farmers' time and cost burdens. Time savings are important for agricultural households, because many crops have extremely time-sensitive and labor-intensive production cycles. Farmers who use mobiles can also save on transport costs (Overa 2006)—an effect that is stronger the more rural the area (Muto and Yamano 2009)

Table 4 perceived role of let in poverty reduction

Roles	SA	A	D	SD	MEAN
Expansion of access to education	83	54	20	13	3.21
Provision/supply of health information	65	78	9	18	3.12
Monitoring of pest/diseases outbreak	23	67	7	3	3.47
Provides information on agricultural inputs	100	45	17	8	3.38
Provision of early warning information	79	58	21	12	3.21
Provides information on market prices	103	50	12	5	3.48
Reduction of business/transaction cost	76	63	11	20	3.26
Creation of employment opportunity	45	101	8	18	3.01
Improves services delivery/revenue	67	77	16	10	3.18
Guarantees transparency and accountability	50	93	7	20	3.02
Encourage people participation in business	54	80	25	11	3.04
Helps increase productivity of farmers	45	94	12	19	2.98
Improve market development access	87	63	15	5	3.36
Provides opportunity for micro-credit	67	54	37	13	3.04
Disseminates disaster alerts for quick	43	78	32	17	2.86
Reduces farm management time and drudgery	63	70	25	12	3.08
Enhances farmers production plan	40	83	14	43	2.76
Improves farmers bargaining power	50	84	34	34	2.88
ICT use reduces social Isolation	47	94	20	9	3.05

CONCLUSION

Poverty is wide and larger percentages in Nigeria who live in rural areas are poor. The use of ICT can become a powerful force in rural poverty reduction and helping society shift to sustainable and consumption patterns. To realize fully this potential, government and development practitioners and other stakeholders should make ICT a key component of

broader and smarter strategies to educate poverty and promote equitable and sustainable development.

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