
The place of information and communication technology in promoting agro-based enterprises in third world countries

Opata, P.I.¹, Nweze J.N.¹ and Rahman M.A.^{2*}

¹Department of Agricultural Economics, University of Nigeria, Nsukka, Nigeria.

²Department of Computer Sciences, University of Lagos, Nigeria.

Opata, P.I., Nweze J.N. and Rahman M.A. (2011). The place of information and communication technology in promoting agro-based enterprises in third world countries. *Journal of Agricultural Technology* 7(2): 207-214.

This paper explored the availability and uses of Information and Communication Technology (ICT) by farmers in order to add value to agricultural products and promote agro-based enterprises. A total of 216 randomly selected farmers from Enugu state, south-east Nigeria constituted the sample size for the study. Primary data emanated from structured questionnaires, interview schedules and focus group discussion while secondary data came from internet resources. Data analysis was done using simple descriptive statistics such as frequencies and percentages. Socio-economic background of the respondents revealed the characteristics of the farmers which portray them in the light of users of ICT's equipments. The study has implication for rural development, and showed prospects for increased use of ICTs in Enugu State. There is need for ICT training programmes for various stakeholders such as agricultural extension agents, the private sectors and farmers. There is also need to create an enabling environment for private sector investment on ICT equipments in the study areas. This will enable more access to and use of ICTs that will permit added value agricultural products and for diversification and growth of agro-based enterprises.

Key words: Agro-based enterprises, ICT, agricultural extension agents

Introduction

The report of the Expert Consultation on Strengthening Regional Agricultural Information System held in Thailand indicated that internet and digital technologies are tools that can play a significant role in facilitating information networking among members of agricultural research system and other stakeholders in developing nation of Africa, Caribbean and Pacific (Paroda, 2003). For years, many agricultural specialists complained about the low level of ICT adoption by farmers all over the world (Guy, 2003). Nigeria was no exception. This study explored the situation of ICT availability and use

*Corresponding Author: Rahman M.A; e-mail: rahmalade@yahoo.com

by farmers in Enugu state in order to provide local-level scientific evidence on the situation; the role of ICT in promoting agro based enterprises; characterize the old and recently developed ICTs, as well as possible strategies for increasing the access and use of ICTs by various stakeholders in order to add value to agricultural products and promote agro based enterprises.

The information and Communication Technologies are sets of technologies that include both new and not so new equipment for human and digital communication. Old equipment includes newsletters, wireless local loops, village kiosks, rural radio broadcasting, including farmer listening groups and radio. New ICTs equipment includes: (1) digital communications, and specifically satellites, Global System of Mobile communication (GSM), and digital radio; (2) computers, personal data assistants (PDAs), email, speech recognition technologies, global positioning (GPSs) and Internet; (3) delivery mechanisms (e.g public access, Market Place for Agricultural Information and Service (MPAIS) and on line centres where buyers and sellers of information meet and trade on agric information and services and telephone centres, mobile internet vans.); (4) computer assisted distance learning which is increasingly acknowledged as having potentials of contributing to promotion of agro based enterprises (World Bank, 2002). Development of national ICT for growth of agro-based enterprises involves developing communities in such a way as to enable them have the information they need in order to continue to produce profitably.

Approximately 70% of Nigerian population engage in agro-based enterprises and are living in rural areas and thus, Nigerian economy is heavily dependent on the agricultural sector. Despite our dependence on agriculture, infrastructures like ICT such as internet and digital technology is pathetic and hence leading our community further backward. Agro-based enterprises are mainly in the informal or private sector of the Nigerian economy. The entrepreneurs are mainly self employed with much focus on agricultural production, processing, marketing and related activities. Farmers, agricultural extension institutions and the government alike have roles to play in the ICT development for the promotion of agro based enterprises. Since opportunities abound around the globe, it is very important for Government to provide connectivity to its citizens, especially various stakeholders, to make them "Information Rich" (Jaggi, 2003).

Over the past decades, international organizations and the developing countries have come to understand the importance of a functioning informal sector. Efforts to strengthen micro and small entrepreneurs are increasingly being understood as important in the overall goal of food security and poverty alleviation. Economic growth, macroeconomic stability and innovative

structure of the economy can be enhanced if favourable conditions for agro based enterprises in the informal market are created. Easier access to technology or improved educational facilities and market information is also possible through most ICT equipments. Market-oriented production requires the use of a real-time market information services. The success of ICT especially Mobile Telecommunication Network (MTN), and other networks and internets in the twenty-first centuries in Nigeria enabled many farmers to use GSM and other ICT tools for market information and income generating activities.

In order to fully benefit from information revolution, Nigeria needs to modernize the agricultural sector by creating conducive environment for the private sector to establish ICTs equipment in the rural areas and to train various stakeholders. Telecentres ensure local access to information technologies as applied and used in agriculture. Globalisation, competitive market forces and the need for value-added farming and more sustainable use of natural resources demand a radical transformation of agricultural methods, especially in smallholdings in low-income countries like Nigeria (Tenku, 2004).

As reportedly pronounced over the last three decades, Nigeria has confronted major declines in per capita food production due to population growth rates that surpass technology advances. The largest numbers of poor and hungry people are in developing countries are situated in developing countries. In the recent past, World Bank (2002) found that ICTs are used basically as tools for implementing Agricultural Knowledge and Information System (AKIS). Most ICT projects involving e-commerce are B-to-C (Business to Consumer), where women market their traditional handicrafts to a retail export market (World Bank, 2002). However as promotion of agro-based enterprise and poverty alleviation program in Nigeria focus increasingly on harnessing the potentials of the information provided through ICTs in agricultural research for promoting agro based enterprises (World Bank, 2002 and Hafkin and Odame, 2002), empirical research should form the bases of policy strategies and program design. However, current knowledge for south eastern Nigeria, through instructive is insufficient to guide interventions for harnessing the role of ICT sector in promoting agro based enterprises. There is need for more local-level scientific evidence on the situation of ICT availability and use by farmers in Enugu state. Such reliable evidence is critical to current promotion agro-based enterprises through ICT programs.

This paper examines 'The Role of Information and Communication Technology (ICT) for promoting agro based enterprises. This includes the situation of ICT availability and use by farmers in Enugu state, 'the role of Information and Communication Technology (ICT) for promoting agro based enterprises', evaluation of the old and recently developed ICTs as well as

possible strategies for increasing the access and use of ICTs by various stakeholders.

Materials and methods

A household survey was carried out in Enugu State, South-east of Nigeria, to obtain data on ICT for income generation and promotion of agro based enterprises. From each of the 3 agricultural zones in the states, 2 local Government Areas (LGAs) were randomly selected where 36 entrepreneurs were purposively selected from each LGA. A total of 216 clients were selected randomly from the state. Data was collected from both primary and secondary sources. Primary data emanated from structured questionnaires, interview schedules and focus group discussion. Information on socio-economic characteristics, levels of agricultural development and levels of promotion of agro based enterprises in relation to involvement in ICTs were collected. Data analysis was done using simple descriptive statistics such as frequencies and percentages

Results and discussion

Socio-economic characteristics of farmers

The analysis show that age distribution of the sample was skewed towards the upper age group of 40 and above indicating that there was a relatively high proportion of middle age respondents in the village. Only 32.4% of them were below 40 years. The majority (61.3%) of the respondents were middle aged (41-55 years) and were capable to make decisions on access to and use of ICTs. All the surveyed farmers were married with children. Household membership includes mother, father, siblings and cousins living with them. About 51.4% of the respondents had dependents numbering five and seven. About 29.6% of the respondents had 8-9 people in the households while the rest 2.4% had 10-20 members in the household. About 33.8% of the subjects, mostly those over 45 years of age, had never been to school while 40% attended primary school. About 19.4% of the respondents entered secondary schools and spent 7-12 years in school. About 6.5%, apart from attending secondary school, also attended tertiary level of education. These suggest that about 66% of the respondents were literate. About 92% employ the services of family members in income generating activities using GSM. One of the respondents in an urban centre, where there was electricity, employed a handful of workers in telephone centres where GSM, computers, internet, and printers were available for

patronage. Most households suggested increased use of ICT in the rural for more productivity and access to information in agricultural business.

An analysis of survey data on the nature of agro based enterprises reveals that village output was estimated to fall into the following proportions: Sixty percent of the respondents were processing and marketing honey; 45% were marketing Nsukka yellow pepper; 30% were producing and marketing cocoyam while 56% were processing and marketing garri; 40% were engaged in small business (processing of cashew nuts, selling frozen fish, trade etc) and government employment. There were multiple responses due to crop mixtures. Most people marketing honey and peppers also produced, processed and marketed cocoyam and garri. Most respondents also had additional crops and livestock used for subsistence only. These include traditional animal raising (pigs, goats, grain); and crops like peanuts and fruits.

Perceptions of the importance of ICT in agro-based enterprises

The respondents were mostly engaged in production, processing and marketing of agricultural products. Radio was among the old ICT. About 20% of the respondents started to use radio over 30 years ago. However, none of the respondents (0%) was aware of how to use radio in conjunction with digital systems for accessing information on the internet (radio browsing), storing radio program and communication with radio audience via internet. About 95% of the respondents strongly agreed that ICT could help local farmers make sound business decisions, create new business opportunities, and achieve profitable and sustainable innovations. About 85.6% agreed that farmers can access information on new technologies and markets through radio and TV programmes and receive support for improved crop production, quality control methods, processing, packaging and marketing. Most strongly agree that access to information is a powerful factor tending to reduce poverty in the rural areas. About 88% of the subjects perceived ICTs as playing critical roles in creating new entrepreneurial opportunities and in accessing productive resources such as credit and land. About 92% believed that ICT services can have a perceptible influence on production, marketing and other important economic decisions confronting rural households while others also believed that technology per se cannot be the solution to the problems of rural development and poverty reduction unless the issue of access to technology' can be resolved.

There is need for the use of ICT on agricultural technology dissemination. This study showed that specific individuals are unable to provide the necessary resources needed for establishing the kind of ICTs that can provide information in agricultural research for access by various stakeholders. The implication is that a

conductive environment is needed for the private sectors to invest in ICT and also train various stakeholders on its use, so that they can have access to its services.

Other uses and effects of ICT

The common ICT used in the study areas were Global System of Mobile communication (GSM), computers, radios, television, and internets. All the farmers studied (100%) used GSM, 2% news paper, 5% use televisions, 20% radios and 8% computers 0.5% use internet. Virtually all the farmers (92%) were using GSM for income generating activities, while 0.5% had telecentres with GSM, computers, printers and internet. ICTs also appeared to have had perceptible and positive effects on the empowerment and social status of phone leasing farmers especially women and their households.

The entrepreneurs were able to received 70-75% of the paddy prices paid by final consumers, as opposed to 65-70% when there was no network coverage. The subjects 30% also believed that market efficiency was improved as highlighted by one example in particular the price of eggs was reported to be 15 naira during the period of the survey, as a result of ICT-based market information. Likewise a vegetable grower indicated that phone network helped them by providing them with easy and instant access to the prevailing market demand and supply situation and, thus aided them in making appropriate production decisions.

Besides, 83.2% of the entrepreneurs argued that use of phone has reduced the role of middlemen who in the past, deceived them in the absence of market information. It was observed that the supply of agricultural inputs such as fertilizer was smoother and more stable due to the introduction of GSM. According to dealers who do business with these inputs, the use of phone had made it possible to forecast the supply situation throughout the year, making it possible to guard against unforeseen circumstances. On the other hand, the lack of such communication facilities has been reported to promote occasional shortages and price hikes. The use of phone in the villages was also reported to have improved productivity, capacity utilization and profitability of small livestock and poultry enterprises by facilitating regular and easy delivery of inputs at lower cost.

Strategies on the way forward for improved access and use of ICT

Various aspects of ICT are easy to use. It is the road, which must be brought to the doorstep of farmers and various stakeholders that are engaged in agro based enterprises. They should be given equal opportunity to master the skill to use this technology to their advantage. There is need to design the

information technology in such a way that a totally every stakeholders can immediately get access to it without feeling threatened and convert acquired knowledge for his wealth creation.

Although ICTs have potentials for profitable agro based enterprises, such potentials cannot be harnessed if the technologies do not get to the end users. This study therefore has implication for Government, agricultural extension institutions and private sectors to provide last mile connectivity to its citizen in agro based enterprises and make them “Information Rich” in agricultural research in Enugu state. Agro based entrepreneurs, consumers and private sector should also agree that access to the digital network, knowledge and resources, apart from providing agricultural research information promote rural development. Government should also create an enabling environment for the private sectors to establish more telecentres, establish Market Place for Agricultural Information and Service (MPAIS) and improve budgetary allocation to the Agricultural Development Projects (ADPs) for providing ICT incentives to ADP extension staff for anticipated workload. This will enable the farmers to have access to the latest information on agricultural technologies and information on processing and marketing. Specific action by the governments include: formulating national objectives and strategies for ICT within the wider development context, food security and poverty reduction and establishing public obligation for ICT actors. Extension workers and others can act as learning facilitators within smallholder communities.

In conclusion, this paper investigated the role of ICT in promoting agro-based enterprises and as well as its implication on the social-economic development of farmers in Enugu state, Nigeria. It is believed that increasing access to ICTs will bring about increase awareness and adoption of ICTs technology leading to the introduction of more information on modern agricultural system in rural communities. It will also increase agricultural production, processing and marketing which will go a long way in food availability, increased farm income, improved nutritional status as well as diversified consumption, processing and marketing of agro-based products in Enugu state in particular, and third world countries in general. These result could work together to bring about combined impact on the generality of various stakeholders in agribusiness towards overcoming the challenges of adding value to agricultural products. The main obstacles in rural areas are limited establishments of ICT's equipment by the private sectors and insufficient knowledge on the use of ICTs due to lack of training.

References

- Guy, W. (2003). The Situation of ICTs in the French Agriculture. EFITA Conference Debrecen July 9-11, 2003.
- Hafkin, N.J. and Odeme H.H. (2002). Gender, ICTs and Agriculture: A situation Analysis Report for the 5th Consultative Meeting of CTA's and ICT Observatory meeting on Gender and Agriculture in the information Society. Draft pp 1-61.
- Jaggi, A. (2003). Information and Communication Technology and Poverty Reduction in Rural India. A Report for United Nation Economic and Social Commission for Asia and the Pacific. Banfkok Thailand, 27- 28 November pp 1-12.
- Paroda, R.S. (2003). Expert Consultation on strengthening Regional Agricultural Information System: Role of ICTs and IRD' Draft Proceedings: Asian-Pacific Association of Agricultural Research Institutions FAO Regional Office for Asia and the Pacific Bangkok, Thailand.
- Tenku, M.A.S. (2004). National ICT Policy Planning and Strategic Intervention in Malaysia.
- World Bank (2002). Information and Communication Technologies in Agriculture. Rural Development Department, Draft. Unpublished August, 2003.

(Received 8 March 2010; accepted 7 March 2011)