iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 4 **Issue:** VIII **Month of publication:** August 2016

DOI:

www.ijraset.com

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Volume 4 Issue VIII, August 2016
ISSN: 2321-9653
International Journal for Research in Applied Science & Engineering Technology (IJRASET)

The Role of Information Technology on Agricultural Production in Nigeria

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Abstract-Effective communication of agricultural information to farmers is crucial in achieving optimum efficiency in agricultural production in Nigeria. IT can help an average Indian farmer to get relevant information regarding agro-inputs, crop production technologies, agro processing, market support, agro-finance and management of farm agri-business, IT in this information age has been recognized as an essential medium of disseminating information and advice to farmers. In Nigeria today, the concept of ITs has become a global concern and the increasing application of the technology in every segment of our natural life, especially through the GSM, radio, television, projectors, internet, video, camera, computers, has been felt. The paper relies on primary source of information and heavily on literature. It highlights the emerging role of ITs in agricultural production in Nigeria and suggests areas of improvement in fulfilling the roles. ITs play numerous key roles in Agricultural production such as: helping in expanding outreach to a large number of farmers; offering a solution to resource and capacity issues within the agricultural sector; improving information flow and connecting people within the rural areas, the challenges identified include poor IT infrastructural development, high charges for radio/television presentations, inadequate capital for farmers and insufficient knowledge of ITs. It is recommended that farmers be encouraged to access and utilize ITs by supporting them financially and materially. Also more awareness creation and training of both farmers and extension agents on the effective and efficient use of IT facilities be intensified by the governments.
Keywords: IT, Role, Agricultural production, Nigeria

I. BACKGROUND OF THE STUDY

"Information technologies are increasing day by day among different communities for obtaining the information about related issues, problems and their solutions. In the context of agriculture production information and communication technologies have played important role in developing countries. Most of the developing countries have obtained fruitful results from the use of new technologies. Internet, mobile phones, radio and television are the most important tools of communication providing knowledge and information to farmers about agriculture. By using these technologies in different countries positive results in agriculture development have been found. In remote areas radio is still the favorite tool of communication, broadcasting many agriculture programs while television contributes more to disseminating information about agriculture in developing countries. Furthermore, mobile phones have reduced the gap among farmers and buyers. Farmers now communicate directly with customers and get a better price for their products on the market. Mobile phones have also provided new approaches for farmers to get, for example, the latest information from the metrological department for weather conditions before using pesticides in their farms. However, internet is also disseminating information regarding price and marketing of goods and farmers are receiving information within minutes from all over the world."

In the context of agriculture, the potential of information technology (IT) can be assessed broadly under two heads: (a) as a tool for direct contribution to agricultural productivity and (b) as an indirect tool for empowering farmers to take informed and quality decisions which will have positive impact on the way agriculture and allied activities are conducted. Information Technology (IT) has long been viewed as having great potential for improving decision making in agriculture. IT has connected the world globally and is now changing our life style and social consciousness dynamically. In all phases of the agricultural industry, information technologies are vital to the management and success of a business. Agriculture has also been greatly influenced by IT.

Information Technology is rapidly becoming more and more visible in society and agriculture. IT refers to how we use information, how we compute information, and how we communicate information to people. People must have computer and information technology. To participate and make informed decisions in the agricultural industry a person must have ability to gather, process, and manipulate data. IT supports new methods for precision agriculture like computerized farm machinery that applies for fertilizers and pesticides. Farm animals are fed and monitored by electronic sensors and identification systems. Selling or buying online began

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to become popular in the world. However, it's most important role remains communication, and the Internet has provided us with an ideal opportunity to do so. One such communication tool is the Web Site, which simply replaces the newspaper as a communication tool. Presently, almost every company has its own web site Wirekoon, 2009

The Information and Communication Technologies can generate new opening to bridge the gap between information haves and information have-nots in the developing countries. The task force on 'India as Knowledge Superpower' emphasized the need to harness ICT for community transformation. The agriculturally prosperous developing countries like India cannot overlook agriculture in such transformation. The emerging ICT have momentous role to perform in agricultural development. There are many possibilities of integration of ICT in agricultural, for the overall agricultural and rural development. Chauhan, 2000.

Radio Frequency Identification (RFID) technology, which has already proven to be extremely effective in tracking and identifying people and products for logistic purposes, can be applied to the agricultural sector in two ways – production management (from tracking growth and reproduction records to integrating transportation information) and inventory management (from boosting operational efficiency to minimizing loss and damages).

Dairy farmers traditionally had to rely on eyesight to identify the livestock tags and ear marks on their cattle herds, swine litters and sheep flocks. Information regarding livestock growth and reproduction were often recorded by hand as well, adding to the possibility of documentation errors when the animals proliferate and multiply. Implanting livestock with a RFID-enhanced microchip or ear tag would not only enable instant identification, it would also preserve a wide array of individual information such as body type, growth development, breeding lineage and lactation quality. The accurate collection of livestock data would greatly facilitate vaccination measures, provide better insight on hereditary characteristics and biological development and boost managerial efficiency, all thanks to RFID technology. Council of Agriculture, 2012

II. STATEMENT OF THE PROBLEM

Nigeria is a vast country with different farming systems involving a variety of crop, cereals, legumes, fibre, root and tubers including livestock production and so on. The agricultural sectors play a key role in the economic development of Nigeria in the terms of food, foreign exchange from exports, raw materials for industries and employment. Unfortunately information about these practices does not reach the rural farmer on time and may not get to them at all. Perhaps the use of information Technology might instigate this problem. Information specialists and extension officers have the primary responsibility of disseminating agricultural information to user population. They are expected to collect all relevant agricultural literature and make it available through various methods such as current awareness services; selective dissemination of information, translation services. IT is seen as an important means of achieving such when used as a broad tool for providing local farming communities with scientific knowledge. Against this background, it is clear that farmers need new improved technologies to transform the traditional agriculture and increase production Nigerian farmers are poor not because they are small but because they do not have access to and ways to convey valuable information to them in other to improve their productivity. Information Technology can be of assistance by enabling extension worker to gather, store, retrieve and disseminate a broad range of information needed by farmer for modern farming (Janes, 1997).

III. OBJECTIVES OF THE STUDY

The main objective of this study is to determine the relationship between information technology and agricultural production and the specific objectives are:

A. Identify the role of information technology on agricultural production;

1) Analyse the challenges of information technology as related to agricultural production; and

2) Determine the way forward to promote the use if information technology in promoting agricultural production.

IV. CONCEPTUAL CLARIFICATIONS/ LITERATURE REVIEW

A. Information Technology

Information technology is utilizing computers along with telecommunication equipment for the storage, retrieval, transmission, and manipulation of data, among other tasks, which are aimed to improve the efficiency of different sectors. With the advancement of IT, other sectors benefit from it as well since it can be used as a tool for improving efficiency and overall productivity. Millef, 2015

B. Technology

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Technology is the application of scientific knowledge to the practical aims of human life, or as it sometimes phrase to the change and manipulation of human environment, the development overtime of systematic techniques for making and doing things. Information Communication Technologies (ICTs) are those technologies that can be used to interlink information technology devices such as personal computers with communication technologies Vancrowder (2001)

C. Agriculture

The term agriculture refers to cultivation of land, rearing of animals, fishing, crop production,forestry and wildlife undertakings, and associated activities that aid food and fibre production to sustain livelihood (Obinne, Ndubilo and Ozowa, (2000).

D. Global Impact of IT on Agriculture

IT has become a bridge for people from all over the world. You may be asking yourself, what is the importance of this when it comes to agriculture? Agriculture may be seen as a craft which has been handed down from generation to generation from the very first men who learned how to plough the fields and grow their own crops. Techniques and secrets for efficiency and increased yields are also part of the knowledge passed on from one generation to another. Agricultural practices and advancements differ globally—since plants have their own differences and the location plays a role on their development as well. But through the exchange of knowledge from different agriculturally-involved individuals from all over the world, improvement of techniques can be experienced as well. It has made an impact on how information is shared, and being able to use this information for the advancement of the agricultural sector gives a great positive impact that is beneficial for everyone.

V. RESULTS AND DISCUSSION

A. Method of data collections

Data were collected using a primary source which is through interview with some farmers, extension agents, IT and Agriculture researchers in Federal Ministry of Agriculture and rural development, National agricultural seed council and National Information technology development agency in Abuja FCT Nigeria. The secondary source of data was from journals, books and the internet.

B. Analytical techniques: Descriptive statistics

VI. RESULTS

A. Role of IT on Agricultural production

1) Information dissemination
2) Computing production data
3) Monitoring
4) Increases opportunities of getting information
5) Awareness with System
6) Improved decision making
7) Better planning
8) Geographical Information System (GIS) In Agriculture
9) Reduces rural farmers vulnerability to conflict situation
10) Reduces illiteracy level of rural farmers

B. Challenges of information technology as related to agricultural production

1) High rate of illiteracy among Nigerian farmers
2) Inadequate finances
3) Lack of technological know how
4) Lack of access to information technology equipment
5) Environment (Location)
6) Lack of political will
7) High rate of insecurity in the study area
8) Absence of institutional framework

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9) Poor infrastructure connectivity services

C. Way forward to promote the use of information technology in promoting agricultural production

From the findings of the study: as a way forward to promote the use of information technology in promoting agricultural production the government and other NGO's need to carry out the followings:

1) Create an Online Crop Bulletins
2) Post Handbooks for Farmers
3) Start a Web Production Team
4) Adopt Standards of the World Wide Web Consortium ("W3")
5) Create both National and Regional Portals
6) Train Extension Staff to use the Web
7) Capacity Building and development
8) Provide a virtual help desk for staff (and site visitors) that receives and replies to instant messages and e-mail

VII. CONCLUSION

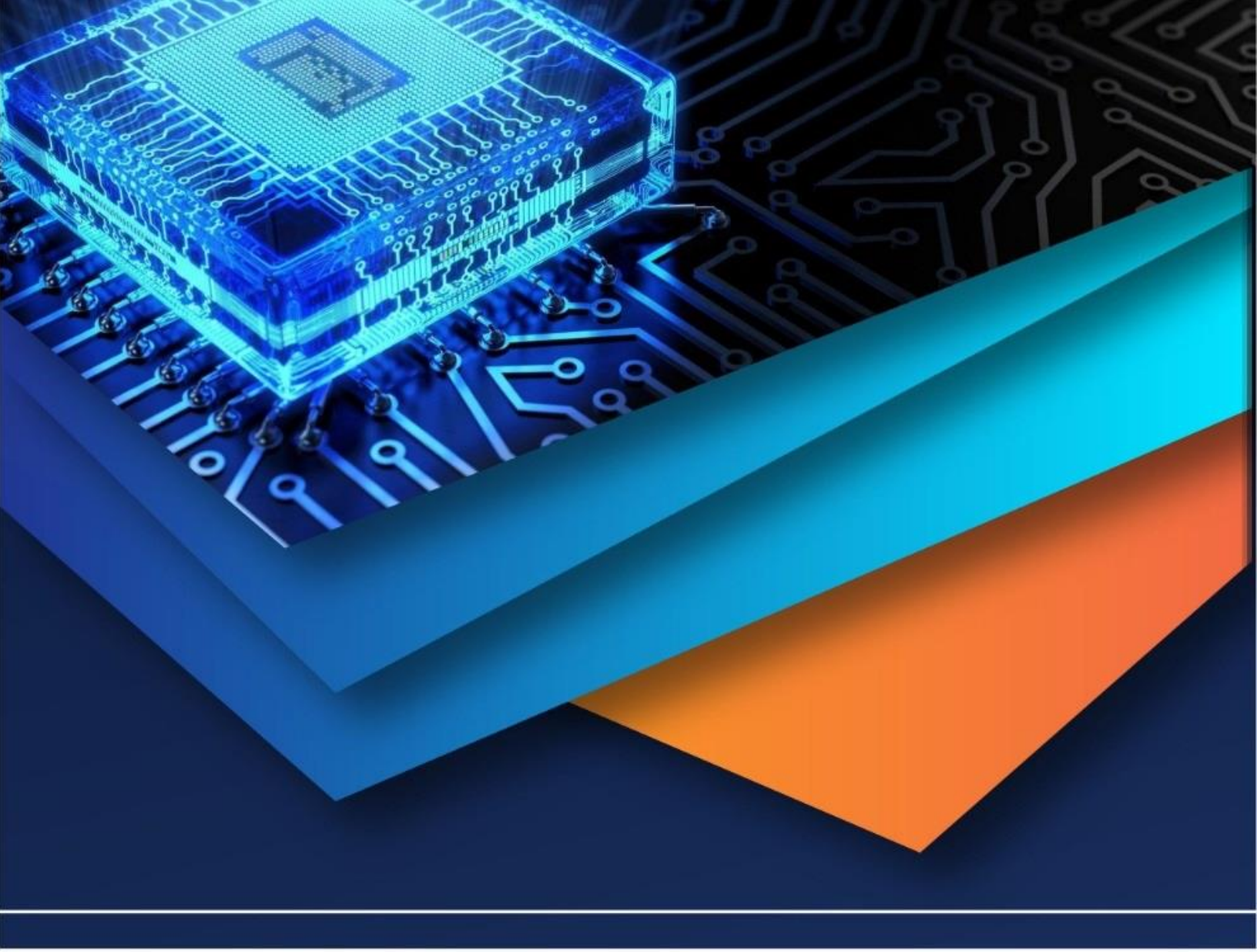
Information technology is expanding rapidly and touches almost all areas of human activity. The Nigerian farmer need to be e-powered to face the emerging issue of deregulation & reduction in agricultural production opening up of agricultural markets, fluctuations in agricultural environment and to exploit possible opportunities for exports. The quality of rural life can also be improved by quality information technology inputs which provide better decision making abilities. IT can play a major role in facilitating the process of agricultural production in Nigeria and meet Challenges of information technology as related to agricultural production. The rapid changes in the field of information technology makes it possible to develop and disseminate required electronic services to rural farmers in Nigeria.

The federal government of Nigeria need proper sensitisation of Nigeria farmers on the role of information technology on agricultural production and how it can increase their yield and also boost the economy.

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