
Sustainable Agricultural Development in Nigeria using Information and Communication Technology

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Abstract

Information and communication technology in agriculture (ICT in agriculture), also known as e-Agriculture, is developing and applying innovative ways to use Information and Communication Technologies (ICTs) in the rural domain, with a primary focus on agriculture. Information and communication Technology (ICT) in agriculture offers a wide range of solutions to some agricultural challenges. It is seen as an emerging field focusing on the enhancement of agricultural and rural development through improved information and communication processes. This paper looks at the uses of Information and Communication Technology in sustainable agricultural development in Nigeria. Several recommendations such as the need for farmers, agricultural agencies and other stakeholders in agriculture to adopt the e-agriculture as a means of enhancing communication between various stakeholders in agricultural sector and also the need for the government to support the adoption of ICT in agriculture were made.

Keywords: Agriculture, ICT, E-Agriculture

Introduction

The term Agriculture was derived from a Latin word known as ‘ager’ which means field, and ‘culture’ which means to cultivate. Agriculture can simply be defined as the cultivation of the soil and rearing of animals for the purpose of feeding for survival. This definition in itself point out the relevance of agriculture in every society. Agwu and Kadiri (2014) stressed that the Lagos Commerce and Industry identifies the agricultural sector in Nigeria as the segment that is most critical to the achievement of the elusive goal of a diversified economy. Based on this information, to achieve sustainable agriculture in this modern age, the application of Information and Communication Technology (ICT) cannot be under-utilized.

According to the minister for Agriculture Akinwunmi Adeshina in President Good luck Jonathan’s government, *‘in the 1960s, agriculture accounted for 65-70 percent of total exports; it fell to about 40 percent in the 1970s, and crashed to less than two percent in the late 1990s’*.

Today, Nigeria remains a net importer of food. Either way, result shows that the Nigerian agricultural sector has dropped significantly. The cause of this over time occurrence is said to be the oil sector in Nigeria and this has brought about neglect of the agricultural sector and a complete focus on the oil sector thereby neglecting the potential obvious in agricultural sector. As the population of Nigeria increase daily, there is need for the agricultural sector to be revived and supported to boom again. It is through agriculture that the nation can boost economic development, tackle the issue of food shortage and starvation. Ching (2008) said,

the bulk of the food produced in Africa comes from small family farms that are primarily cultivated for family needs.

Agriculture plays a significant role in economic and social development in most less-developed and developing countries. Agriculture faces a range of modern and serious challenges, particularly in developing countries exposed to price shocks, climate change, and continued deficiencies in infrastructure in rural areas. Adequate dissemination of detailed information is a necessary condition for improvement of all areas of agriculture (Zhang et al., 2016). Empirical research also suggests that Information and Communication Technology (ICT) has a positive impact on the development of any nation.

Information and Communication Technology (ICT)

Information and communications technology (ICT) is refers to technologies that provide access to information through telecommunications. This includes the Internet, wireless networks, cell phones, and other communication medium (National Bureau of statistics, 2012). Agwu (2012) stressed that Information and Communication Technology (ICT) is an umbrella term that includes communication device and applications such as radio, television, computers, cell phones, mobile phones, satellite etc.

However, Osakwe (2012) said that Information and Communication Technology (ICT) means different things to different educators and researchers; hence there are various views and definitions of Information and Communication Technology. Abubakar (2010) found that some scholars see it as a term that encompasses a lot of activities involving the acquisition, storage, processing and dissemination of information through the use of appropriate software and hardware designed for that purpose. Furthermore, Agwu et al. (2014) posited that Information and Communication Technology (ICT) had developed in a fast rate in Nigeria and has help to drive the Nigerian economy faster than imagined. Eke (2013) confirms this in the Daylive online and stated that it is generally accepted that Information and Communication Technology (ICT) will drive the transformation of Africa, with Nigeria in the forefront. According to Awe (2012), Information and Communication Technology (ICT) has become a major tool for learning, work, recreation and innovation. Information has become the key enabler and currency of this era and Information and Communication Technology (ICT) is the driver.

Information and Communication Technology (ICT) has taken a central position in all spheres of human endeavour. Their roles in societal development have been considered pervasive. This shows that Information and Communication Technologies (ICTs) now serves as backbone for societal development in all ramifications and Information and Communication Technology (ICT) is now applied to all field of human endeavour. The role of information increased immeasurably as a result of social progress and the vigorous development in science and technology.

There are a number of Information and Communication Technology facilities useful in information management, utilization and dissemination in agricultural practices. These include Radio, Television, Video, Computer (CD-ROM, DVD, Video CD etc.), Phone/GSM and Internet (Web (www), Web chatting, E-mail, Tele/audio conferencing, Voice over Internet Protocol (VoIP), Digital and Satellite TV, Electronic Library Resources).

The spread of the use of Information and Communication Technology (ICT) in Nigeria has been fast. Before, Information and Communication Technology (ICT) was focused on areas of broadcasting compared to what we have presently.

Deploying Informational and Communication Technology for Agricultural Sustainability

Effective communication of agricultural information to farmers is crucial in achieving optimum efficiency in agricultural development and practice in Nigeria. Agricultural development in this information age has been recognized as an essential medium of disseminating information and advice to farmers and this is achieved through Information and Communication Technology (ICT) platforms.

Agriculture is an important sector with the majority of the rural population in developing countries depending on it. The sector faces major challenges of enhancing production in a situation of dwindling natural resources necessary for production. The growing demand for agricultural produce, however, also offers opportunities for producers to sustain and improve their livelihoods. Information and communication technologies (ICTs) play an important role in addressing these challenges and uplifting the livelihoods of the rural poor.

Today, the concept of Information and Communication Technology (ICT) has become a major concern and the increasing application of the technology in every segment of our natural life, especially through the Global System for Mobile Communication (GSM), radio, television, projectors, internet, video, camera, computers, Electronic wallet (e-wallet), has been felt.

Information and Communication Technology (ICT) can be defined as any device, tool, or application that permits the exchange or collection of data through interaction or transmission. It “includes anything ranging from radio to satellite imagery to mobile phones or electronic money transfers.

Agriculture plays a vital role in the social and economic development of most African countries and is the main contributor to economic growth and stability. Application of Information and Communication Technology (ICT) in agriculture is increasingly becoming steady in developing countries and this could facilitate self-reliance for national growth. Information and communication technology in agriculture (ICT in agriculture), also known as e-agriculture, is developing and applying innovative ways to use ICTs in the rural domain, with a primary focus on agriculture.

Information and communication Technology (ICT) in agriculture offers a wide range of solutions to some agricultural challenges. It is seen as an emerging field focusing on the enhancement of agricultural and rural development through improved information and communication processes. In this context, Information and Communication Technology (ICT) is an all-encompassing term for communication devices and applications. These include print media, radio, television, mobile phone, computer hardware, computer software and network systems. Information and Communication Technology (ICT) includes both traditional and new technologies which together provide effectiveness in information processing and communication. The appropriate Information and Communication Technology (ICT) application for the microenterprises is the mobile phone (Litondo, 2010).

Information and communication technology in agriculture which is e-Agriculture continues to evolve in scope as new Information and Communication Technology (ICT) applications continue to be harnessed in the agricultural sector. More specifically, e-Agriculture involves the conceptualization, design, development, evaluation and application of innovative ways to use Information and Communication Technologies (ICTs) in the rural domain, with a primary focus on agriculture. Provisions of standards, norms, methodologies, and tools as well as development of individual and institutional capacities, and policy support are all key components of e-Agriculture.

Farming Activities and Information and Communication Technology

Farming activities in Nigeria are still being carried out by means of non-ergonomic tools, crude hand tools like hoe, cutlass and thereby limiting the production capacity of these

farmers. Access to farm tractors is mainly through government agencies, state or local and rarely serviced 15% of the farming populace annually.

Nigerian population increase rate is put at 2% and with a projection of close to 200million by the year 2020. With the aforementioned at the background, it became expedient that any means of rapid and proven agricultural transformation should be sourced urgently and implemented. The identified method is mechanized agriculture and the advantages associated with full implementation of ICT-agriculture (e-agriculture) could be harnessed in the implementation. While mechanization is the prime mover to drive the accelerated agricultural production and processing, the ICT-agriculture is a means of rapid service delivery, a tool to promote various mechanization facilities or equipment, techniques and or technologies.

Information and Communication Technology (ICT) in agriculture has been officially endorsed at the World Summit on the Information Society (WSIS) in 2003-2005. ICT-agriculture covers all aspects including research, planning, monitoring & evaluation (PM&E), engineering and science of production, processing, extension services etc.

Information and Communication Technology and Agricultural Development

Information and Communication Technologies (ICTs) in agriculture have the potential to facilitate greater access to information that drive or support knowledge sharing. Information and Communication Technologies (ICTs) essentially facilitate the creation, management, storage, retrieval, and dissemination of any relevant data, knowledge, and information that may have been already been processed and adapted (Rao, 2007). Information and Communication Technology (ICT) in agriculture is an emerging field focusing on the enhancement of agriculture and rural development in India. Information and Communication Technology (ICT) can provide with accurate information necessary for the farmers which facilitates better agriculture output.

Through the public private partnership, private initiatives and government programmes are made for agriculture development. But in Indian still in growing stage and evolving as an emerging trend the benefit of Information and Communication Technology (ICT) is yet to reach all the farmers. Perhaps technological innovation many farmers, especially who are original and share cropper are not getting proper information and service due to poor economic condition and social constraints. Other factors are illiteracy, language barriers and unwillingness to adopt the new technology.

The way in which Information and Communication Technology (ICT) projects access, assess, apply, and deliver content may increase the likelihood of Information and Communication Technology (ICT) use by farmers and thus may become an important factor in a project's success. To address the information needs of farmers, relevant content is a key component of Information and Communication Technology (ICT) projects. The extent to which content is customized and localized to a farmer's condition influences its relevance. Local content has been defined as content that is intended for a specific local audience, as defined by geographic location, culture, or language or as content that is socially, culturally, economically, and politically relevant to a given society. Thus, local content is the expression of a community's knowledge. Local content includes external or global content that has been transformed, adapted, and assimilated into a knowledge base. Yet Information and Communication Technology projects may not always be relevant to local context and needs, because of a disconnection between the project and its end users (Ballantyne, 2002).

The benefit of Information and Communication Technologies (ICTs) is yet to reach all the farmers, especially those who are marginal or sharecropper and living in remote part of the

country are not getting this service or its better to say they are not availing this due to poor economic conditions, communication barrier and social constraint. Other factors are illiteracy, language barrier, poverty, unwillingness to adopt the new technologies and shortage of government official in agriculture department.

Conclusion and Recommendation

Information and communication technologies (ICTs) play a significant role in a country's development and the strategic application of information and communication technologies (ICTs) to the agricultural sector offers the best opportunity for economic growth and poverty alleviation.

It is recommended that farmers, agricultural agencies and other stakeholders in agriculture to adopt the e-agriculture as a means of enhancing communication between various stakeholders in agricultural sector and also the need for the government to support the adoption of ICT in agriculture were made.

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