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Role of ICT in Agricultural Development

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ABSTRACT

ICT (Information and Communication Technologies) refers to technologies that provide access to information through telecommunications medium such as the radio, television, cell phone, computers, satellite technology; internet including email, instant messaging, video conferencing and social networking websites which have made it possible for users across the world to communicate with each other to give users quick access to ideas and experiences from a wide range of people, communities and cultures. 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 products, however, also offers opportunities for producers to sustain and improve their livelihoods. Information and communication technologies play an important role in addressing these challenges and uplifting the livelihoods of the rural poor and have proven to be useful in other aspects of agricultural development. Eg, fight against farm pests and diseases, Widen Market Access, Decision Support System, and Health services, etc.

Keywords: ICT; agriculture; farmers, agriculture related information and development.

INTRODUTION

ICT brings about social and economic development by creating an enabling environment. Almost every single activity in the modern world is becoming more dependent on the application of ICT for one use or another [1]. The benefits of ICT reach even those who do not themselves have first-hand access to them. Through ICT, for example, an agricultural extension worker can learn new technologies, rainfall forecasts, commodity prices and use that information to advice farmers in rural areas. The importance of ICT in agricultural development process was long recognized and access to ICT was even made one of the targets of the Millennium Development Goal. In Africa, agriculture provides a livelihood for most of the 75 percent of the people who live in rural areas [2]. Unfortunately, the rural areas in Africa have the largest concentration of poverty and food insecurity. One of the causes of the low incomes in rural Africa is the low productivity of agriculture. Therefore, any attempt to reduce poverty should pay particular attention to transforming the agricultural sector, especially sustained improvement of land and labor productivity in the sector, facilitated by remunerative markets [3] [4] [5]. Lack of technological and market information has been given as the major reason for the low productivity in African. Agriculture Knowledge and information have become the major drivers of social and economic transformation in the world. Knowledge and information are now as important, if not more, factors in development, and this trend is set to intensify. Agricultural education and extension can play a critical role in the transformation process to transfer technology, support learning, assist farmers in problem-solving, and enable farmers to become more enlightened on the modern ways of farming, thus boosting their production. Many farmers have complained about the unavailability of extension staff in their

locality for consultation or advice [6]. This makes it hard for most small holder farmers to have access to information and learn new farming technologies that will improve the sector. One promising area to do agricultural extension to reach large number of farmers is using information communication technologies (ICT): mobile telephony, innovative community radio and television programs, mobile phones in combination with radio, video shows, information kiosks, web portals, rural tele-centers, farmer call centers, video-conference, offline multimedia CDs, open distance learning among others [7].

Role of ICT in Agriculture

Information and Communicational Technology (IT) has many roles to perform for agricultural development starting from decision support system to the trading of crops.

Decision Support System; ICT has a great role as decision support system to the farmers. Through ICT, farmers can be updated with the recent information about agriculture, weather, new varieties of crops and new ways to increase production and quality control. ICT have helped majorly in dissemination of adequate, efficient and tailored information to the rural farmers. Information and communication technologies can broadcast the precise and authentic information at right time to the farmers so that they can utilize it and get benefits. The decision support system through ITC facilitates farmers for planning type of crops, practicing good agricultural practices for cultivating, harvesting, post harvesting and marketing their produce to get better results [8].

Widen Market Access; one of the major drawbacks in some developing countries agriculture is complex distribution channels for marketing of agricultural produce. Farmers do not get acquainted with the updated prices of commodities, proper place for selling their inputs and consumer trends also. ICT has the great potential to widen marketing horizon of farmers directly to the customers or other appropriate users for maximum benefit [9] [10]. Farmers may connect directly with many users and may get information about current prices for their commodities. They can get access to the market sitting at home. Further, it will curtail the middle profit also which will be beneficial for the farmers. This can improve a farmer's source of revenue; empower farmers for making good decisions about appropriate future crops and commodities and marketing channels to sell their produce as well as to get inputs.

Strengthen and empower farming community; ICT technologies can help for strengthening farming communities through wide networking and collaborations with various institutes, NGO's and private sectors. Further, farmers may enhance their own capacities through updated information and wide exposure to scientific, farming and trade community. Strengthen capacities and better representation of their constituencies when negotiating input and output prices, land claims, resource rights and infrastructure projects [11].

Pest and disease control; Information about pest and disease control, especially early warning systems, new varieties, new ways to optimize production and regulations for quality control. Information and communication technologies have proven to be useful in other aspects of agriculture and also in the fight against pests and diseases.

Some services are already operational or are about to become operational. Agricultural Extension Workers, Doctors, etc. can be accessed for consultations through ICT networks, thereby bringing expert advice to reach farmers [12]

Health services; Agricultural Extension workers, Doctors, etc. can be accessed for consultations through ICT networks, thereby bringing expert advice to reach the farmers without stress.

Some ICTS Challenges in Agriculture

However, challenges exist to using ICTs in this field, such as:

- Erratic power supplies
- Fluctuating networks
- High costs of ICT infrastructure
- Low incomes of rural farmers
- Lack of policies to enhance ICT development in rural areas

- Lack of necessary skills to use the technology

CONCLUSION

Agriculture is one of the indispensable sectors in our country. It is well known fact that ICT can revolutionize agriculture in many ways [13] [14] [15]. ICT projects are yet to make any breakthrough in agricultural information dissemination and other areas. Deployment of ICTs needs to be stressed more. ICT for agricultural projects needs to be compared and evaluated precisely. It is need of hour to obtain apposite information through ICTs and to deploy advanced ICTs in agriculture.

Having reviewed and analyzed current ICT-based information service models, the following suggestions that are relevant to government organizations and ICT developers can be provided for future development and research:

- Evaluation of the effectiveness of existing strategies and policies to run ICT projects in agriculture based on the feedback of grass root level workers/officers working directly with farmers in rural regions.
- Transforming agriculture sector into the modern digital agriculture to further improve social and economical benefits.
- Improving the digital access by farmers with technological advances and skills improvement.
- Adopting more advanced ICT tools in agriculture such as GPS, GIS, RFID, Remote sensing, Smart device for precision agriculture, sustainability, environment, food safety, etc.
- Analyzing and managing Big Data in agriculture.

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