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ICT in Modernizing Agricultural Extension Services in Bangladesh

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Abstract

The main public agricultural (crop sub-sector) extension service provider in Bangladesh is the Department of Agricultural Extension (DAE) under the Ministry of Agriculture. It has grassroots level extension service provider (Sub-assistant Agriculture Officer, SAAO) per 1,000 farm families under each union. Most of the agents depend on traditional means of communication to send across time bound agricultural information and research findings to farmers. This is no longer effective in the present dispensation if the farmers must achieve sustainable food production and nutritional sufficiency for the natio1n. This paper therefore, examined the usefulness of information and communication technology in the enhancement of agricultural extension services in Bangladesh. It equally looked at the rationale for the use of ICT in agricultural extension services. Some useful recommendations were made among which are use of smart phone for access to update information, ICT innovation development in the field of extension and adoption to the field, video conferencing for forecasting and quick technology dissemination, access to market information, GIS remote censoring for enhancement of cropping intensity and diversity, monitoring of the activities of the extension personnel, database management and enhancing easy access to database etc. The Ministry of Agriculture should invest in ICT development for crop extension services, in-service training of the extension agents in ICT and the farmers on usability of ICTs for information dissemination and retrieval.

Keywords: *ICT, extension service, DAE, AIS, GIS*

Introduction

There are three types of extension service providers in Bangladesh. The major extension services are provided by the Government Organizations (GOs), which includes Department of Agricultural Extension (DAE), Department of Livestock Services (DLS) and Department of Fisheries. Other extension service providers in Bangladesh are Non-Government Organizations and the Private Sector. The major role of agricultural extension is to disseminate technology to the intended user and induce behavioral changes towards adoption of technology. The adoption of improved framing practices would increase production and maintain a balance with demand for increased food production.

Information and communication technology, according to Unagha (2006) is an omnibus term that encompasses computer and telecommunications technology. It is a technology that is used in producing, organizing and distributing information. Wirsiy and Shafack (2002) see it as a broad-based term that encompasses the gathering (acquisition), organization (packaging), storage and retrieval (dissemination) of information that can be in textual or numeric (books and documents),pictorial and vocal forms (audio-visual), using combination of all the above (multimedia) including computers and telecommunications (telephones).There is no gain saying the fact that information

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and communication technologies are the nervous systems of any contemporary society. It has led to a lot of achievements and innovations in different sectors of the economy including agriculture. In this context, e-agriculture describes an emerging field focused on the enhancement of agricultural and rural development through improved information and communication processes. 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.

An effective agricultural extension depends on extension messages (information) reaching many farmers and farmers' problems in reaching extension staff quickly and regularly. An extension agent is the only field level worker who teaches the production recommendations directly to farmers. Through the extension personnel, therefore, it is expected that farmers receive benefits from agricultural research with the ultimate target of raising his agricultural production efficiency and effectiveness. It is noted that in Bangladesh extension agents still depend heavily on traditional extension methods of communication with limited use of ICT based media like smart phones and cell phones. This is no longer effective for the time bound research discoveries and the high level of farmer extension agent ratio in the new millennium.

Rationale for the use of ICT in Modernizing Agricultural Extension Services: A General Consideration: The extent to which the extension agents effectively carry out all important functions of communicating with the farmers leaves much to be desired. This is in view of the fact that the ratio of extension agents to farmers is very low. The present field level extension agent versus number of farm families is 1:1000. As extension services have been diversified, it is very hard to reach each farm families by one extension service provider, the Sub-Assistant Agricultural Officer (SAAO). Ekong (2005) opines that it is ideally expected that farmer-extension agents ratio in any country should be 750 farm families or less to one full-time extension agent.

Constraining factors such as distance, condition of roads, poor communication capacity, dialectical problems, poor transportation facilities and inadequate funding pose great problems to effective communication of information to farmers. It is therefore, clear that the traditional mode of transmitting research findings to farmers through face to face encounter only can no longer adequately handle time bound information that should circulate within the farming population. Innovative changes brought into the field of agriculture scarcely reach the rural farmers who are the major stakeholders as far as food production in this country is concerned. Uwaka (1983) regrets that many new ideas and improved practices advocated by extension officers are difficult for many countries including Bangladesh, African, and Vietnamese farm families to obtain. Similarly, Chadwick (2003) opines that agricultural development in many countries including Nigeria has been hampered by how level of agricultural information exchange. By implication, the outstanding problem lies in the fact that current research findings do not reach the farmers as and when due. The scenario in Bangladesh is different with availability of cell phones and ability of purchasing capacity of the farming community.

Effective communication reflects a situation in which a skillful communicator duly sends a useful message through the proper channel to the appropriate audience who

responds as desired (Unamma *et al*., 2005). However, the emerging challenge to the farmers of Bangladesh in this new millennium is how to cope with information explosion and global trend in agro-technology. There is the need therefore, for inter-related and communicatively linked systems to diffuse information and technological innovations to farm families. The role of research as a source of technical knowledge for the development of agriculture is critically vital but as observed by Nwachukwu (2003), there is a dire need to transfer technology from the technology developers to the technology utilizers through effective communication media. Herein lies the rationale for utilizing ICTs in modernizing agricultural extension services particularly in this new millennium for Bangladesh.

Using ICT to Modernize Agricultural Extension Services in Bangladesh: Adivi (1996) describes modern technology as a science that deals with all the creation, transmission and application of knowledge designed to bring about planned changes in the behavioral complex of people with a view to helping them live better life through learning new ways of improving their vocation, enterprises and institutions. The use of ICT has arisen because of the need to cope with information explosion in various sectors including agriculture. In order to keep pace with disseminating the increasing number of information or discoveries from different research institutes, computers and telecommunications must be utilized to handle information processing and dissemination with greater speed and accuracy than manual processing and delivery through extension agents. We live in a rapidly changing world marked by increasing emphasis on information.

Broadly speaking, information refers to data and knowledge of related inputs and outputs of a system including ways in which these are transformed within the system (Ozagediz and Ostem,1998). Communication includes all the methods and mechanisms enabling access to information products and their circulation between the various kinds of actors in its administration. Since information is the major tool for extension service, communication or the dissemination of information about agricultural operations and productions play a vital role in sustaining an effective agricultural extension service. Hence, Nwachuckwu (2003) avers that agricultural communication is the effective transfer of agricultural technological innovation from technology developers (e.g. research institutes, universities, private organization etc.) to the technology utilizers (e.g., the farmers). For an agricultural information to be useful, the extension agents have to map out the information and communication needs of farmers within their agricultural and socio-economic systems and help key elements in that system to find information they need, when they need it, inaccessible terms and language, at prices that are realistic at the given available resources and development objectives. Effective communication of agricultural information to farmers is of critical value in achieving optimum efficiency in agricultural extension administration and practice in Bangladesh.

Various forms of ICT devices abound in Bangladesh today. It is expected that these available forms of ICT devices should be effectively utilized by extension agents to enhance agricultural extension services. The available ICT facilities are grouped into broadcast technology, print technology and telecommunication/computer technology, smart phones etc. (Okon, 2005). Broadcast technology refers to the broadcast media

such as radio, projectors, media van etc. Print technology includes print media such as newspapers, magazines, bulletins, posters, calendars of work, newsletters, leaflets, pamphlets etc. The telecommunication/computer based technologies include telephones, global system and mobile system, computers, facsimile (fax), electronic mail service (e-mail), CDROM, internet etc. Radio communication is obviously one of the fastest, most powerful and in most countries the most popular means of communication with the rural farmers. It defeats obstacles faced by extension workers (Omosa, 2001). Various studies have indicated that as far as agricultural extension work is involved, radio has proved to be one of the most vital and most effective means of disseminating agricultural information and innovations in the developing societies where the greater majority of the rural farmers are illiterates. For instance, Mundy and Sultan (2001) state that in Mali, the establishment of community radio stations within a radius of 100km enables extension officers to reach about half a million farmers in their local languages. The use of local dialect in area of reception encourages addressing of issues of local interest thus breaking literacy barrier created in print media. The television set combines sight and sound thereby increasing the possibility of grasping and retaining the subject matter presented. It provides its audience with a sense of participation, personal access and reality which approximates face to face contact. Projectors can be used to disseminate information using motion pictures, slides, transparencies etc. by extension officers to demonstrate different farming techniques. Smartphone or GSM can be used to communicate information between extension agents and farmers or react to questions relating to farm problems with the advantage of possibility of feedback.

The increase in accessibility to computers nationwide and new computer software packages now makes it possible to use the computer as a means for communication, information storage and retrieval in Bangladesh. E-mail is the most commonly used new ICT facility and has caused a cultural revolution in the way individuals and organizations interact in terms of time, cost and distance. Research institutes, NGOs and government sectors make use of their e-mail facility to send messages to other sectors and head offices, request for information, set up meetings, negotiate contracts, submit reports and keep in touch with people within and outside the country. This could be employed in agricultural extension services if the enabling environment is provided. The use of smart phones, video conferencing, voice messaging etc. may be another ICT devices for agricultural innovation dissemination. These and other ICT facilities could be employed in agricultural extension services to ensure effective service delivery.

Achievement so far in Bangladesh: Bangladesh government has clear goal of developing digital Bangladesh within 2100. As a result a2i project has been initiated by the GOB and being implemented by the Prime Minister's Office. The project has launched innovation sub-projects including agriculture sector. In the crop sector three innovations have been rewarded for developing Apps for to combat farmers' regular problems, which includes: crop cultivation procedures, insect pest and control measures, and timely extension services for the farmers. The innovation projects has been matured and DAE is going to mainstream the innovation through uploading the Apps in smart phones for the SAAOs.

Other achievements in Bangladesh are as follows:

1. Agricultural Information and Communication Center (AICC) by Agricultural Information Service (AIS)
2. Bangladesh Agricultural Research Institute (BARI) has launched "Agriculture Knowledge Apps".
3. Bangladesh Rice Research Institute (BRRI) has launched "Nutrient Manage" Apps for the end users.
4. Soil Resource Development Institute (SRDI) has launched "Online Fertilizer Recommendation" Apps.
5. Krishok Help Line (7676) by Banglalink in collaboration with DAE
6. "Agricultural Knowledge Portal" by USAID
7. M-Apps by EATL
8. Knowledge Portal by BIID
9. "Batighor" by Grameen Network
10. M-Agriculture by CARE etc.

Conclusion

World Bank (1990) recommended that extension should forge new links and create networks for sharing knowledge and experience. Hence, there is need for the application of information and communication technologies in information dissemination to farmers. Food and Agricultural Organization (FAO, 1993) opines that information technologies bring new information services to rural areas over which farmers as beneficiaries will have much greater control than otherinformation channels.

The use of information and communication Technologies has arisen because of the need to cope with information explosion in various sectors including agriculture. In order to keep pace with disseminating the increasing number of discoveries from various research institutes, computers and telecommunications should be utilized as they ensure greater speed and accuracy than manual delivery through extension agents. It is hoped that with proper harnessing of the potentials of ICTs by extension agents, Bangladesh agriculture will be transformed such that the rural poor will have access to global knowledge system. When Bangladesh agriculture has been transformed the problem of food security, especially the access to nutritional food, would have been solved and the standard of living improved for all. Extension officers are the ones that provide proper management of information, communication and knowledge that allow farmers to make better management decisions that will improve their long-term livelihoods and enhance global linkage. However, for ICTs to successfully facilitate extension officers' role of information dissemination, such enabling variables as accessibility, capacity of use and other constraining variables have to be taken into consideration. The results of increased available knowledge that ICTs facilitate on the farmers will include higher income, improved efficiency in product harvesting, processing and storage, higher yields ensuring improved food security, improved livelihoods etc.

Recommendations

1. As a matter of priority, government should embark on aggressive development of rural areas, ensuring that electricity supply is regular and

helping to subsidize ICTs for farmers. The ICT devices, especially the smart phones to extension workers and progressive farmers on subsidy basis.

2. All mobile service providers must as a matter of necessity strengthen their telecommunication network in Bangladesh with particular emphasis on the rural areas where the farmers and extension agents are located.
3. Information and Communication Ministry should closely monitor the activities of the service providers to ensure that users are not exploited unnecessarily and that efficient services are provided.
4. Ministry of Agriculture (MoA) should ensure the airing of agricultural programs on radio and television stations at such times that they will be useful to the farmers.
5. The government should establish television viewing centers in rural areas where agricultural programs can be broadcast and viewed by rural farmers.
6. Government should step up effort at ensuring that the current drive at maintaining steady power supply is sustained.
7. The Ministry of Agriculture (MoA) should work cooperatively to recruit and deploy more qualified and ICT literate extension agents.
8. The Ministry of Agriculture should update the extension communication facilities available to the extension agents with more modern information and communication technologies with more emphasis through ICT Development Projects in Agriculture Sector.
9. The Ministry of Agriculture (MoA) should invest in training the extension agents in service and the farmers on usability of ICTS for information dissemination and retrieval. Such training could come inform of seminars, conferences, workshops or train the trainers courses.

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