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Use of information and communication tools for north-Eastern region of India: A paradigm shift

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Abstract
Information and Communication Tools (ICT) have recently gained a groundswell of interest and are an important and significant research area for many researchers around the world. However, fewer have achieved greater success in the effective use and its implementation of such tools, whereas the majority are still in the path of progress and especially in the remote areas, the percentage of adoption is quite low due to knowledge and lack of resources and other known and hidden constraints. The adoption of such technologies can change the face of Education, Agriculture, Medical and even hundreds of more which can improve the economic status of farmers. Regular Training to the poor farmers and scientist- farmers interactions in the selected areas can bring a confidence in the poor neglected farmers of remote areas can further enhance their usage and their empowerment can strengthen their socio-economic condition and reduced technology gap too. These tools can reduce the timings of Implementation of Integrated Pest Management strategies and build up the confidence in poor neglected farmers. A research work relating to the importance of the Information era with respected to Integrated Pest Management in the North-eastern part of the country has been proposed at the ICAR- National Research Centre for Integrated Pest Management, New Delhi.

Keywords: Communication, information technology, north-eastern. remote, tribal

Introduction
The North-Eastern States of India is often illusively constructed as a homogeneous entity inhabited by the tribal community and the fact that these states shares certain common problems like ethnic unrest's, poor agricultural production, insurgency, immigration, drug trafficking, communication gap etc. The Government of India is encouraging various schemes and projects to be implemented in these states for Socio-economic status upliftment of the poor neglected farmers, whose main occupation is Agriculture. The Indian Council of Agriculture and Research, New Delhi is also providing special budget/funds aimed to transfer these useful technologies for the North- Eastern States to improve the agriculture system and crop productivity as these states are one of the most ethnically and a linguistically diverse region in Asia and each state has its distinct cultures and traditions. These tools can also improve the livelihood of the poor farmers of the study area, if implemented with a farmer's participatory mode.

The effective utilization and implementation of such information and communication tools focus on the enhancement of agricultural and rural development through improved strategies and processes. More specifically, it involves innovative ways to use information and communication tools and technologies in the remote areas of the north-eastern state. Recently developed tools and their implementation viz. Expert systems, information and communication App and simulated weather information can make IPM's decision easier for proper implementation by these farmers is quite popular. Information, and communication technology is an innovate umbrella that includes any communication device or application, encompassing electronic communication. It includes the use of radio, television, cellular phones, computer and network hardware and software, satellite systems, and so on, as well as the various services and applications associated with them, such as videoconferencing, e-choupal, and distance learning. It is felt to promote better information access to improve the socio-economic status of the farmers has always been the top priority of agricultural researchers, extension workers, and rural advisory service providers.

Decision- making software such as pesticide adviser developed by ICAR-National Research Centre for Integrated Pest Management, New Delhi, for their judicious use has also been developed and is being used. But the mode that is most popular among the farmers of the study area and the usage and access of such tools is still not well documented. The fact these technologies and tools play a vital role in the digital era than it did for previous generations

due to present- day generation having a high level of technological literacy. The networking and digital system have made a paradigm shift our economy concept with no boundary in time and space because of ICT.

ICT being a strong pillar in the socio-economic development can gain National competitive advantage and can hence bring a lot of advantages for economic development enabling millions of transactions to happen in an easy and fast way and has become an essential part of everyday life for many people. It increases its importance in people's lives and it is expected that this trend will continue, to the extent that ICT literacy will become a functional requirement for people's work, social, and personal lives. The increase in this literacy coupled with recent technological advances has led to the expansion of technology in agriculture. Hence, technology has to be embraced in today's agricultural system to improve the quality of human life because it can be used as a strong learning and education media to the farming community, the mass communication media in promoting and campaigning practical and important issues related to pest and management of various important crops and provides wider knowledge that can help in gaining and accessing information. As a matter of fact, we are living in a constantly evolving digital world. The digital age has transformed the present day people communication, network, seek help, access information and learn. Researchers and extension workers must recognize farmers are now connected by an online meetings and access is through a recently developed tools such as computers, TV and mobile phones. ICT is basically our community efforts to upgrade its current and emerging citizens valuable knowledge and skills around computing and communications devices, software that operates them, applications that run on them and systems that are built with them.

The successful implementation of ICT-led extension services/projects, the integration of public services (Central and State Departments of Agriculture and Allied Sciences), private knowledge providers (Input dealers, Agribusiness farms, NGOs) for and farmers in the region they are serving is what will solve such an information device or digital device. These agencies can serve as intermediaries to acquire and disseminate information of benefit to farmers when and where farmers cannot have and maintain their own connectivity such coordinated efforts will mean the involvement of all stakeholders in the process of dissemination of agricultural information through ICT (Baruah 2018) [3]. Against the backdrop of this pressing concern, the proposed study provides deeper insights into the ICT related perception of farmers in the present study area, and highlights areas of ICT implementation that need to be addressed in order to affect proper dissemination of agricultural information in the region.

Kharmudai, 2018 [11], carried out a study on the farmers registered under the mobile- based agro-advisory service m4agriNEI which is operating in Meghalaya in which the respondents were randomly interviewed for the study. It is observed that majority of the farmers approximately 69.44% responded to medium communication behaviour. Through the services provided by m4agriNEI are highly utilised for seeking information, their utilisation for processing and dissemination of information is relatively low. Formation of m4agriNEI facilitated farmers' forum for discussion and sharing of information is highly suggested.

Similarly a study was carried out to determine an attitude of farmers towards another ICT tool- aAQUA e-Agriservice to assess its impact in terms of knowledge gain about Improved Dairy Farming Practices (IDFPs) in Pune, Nasik, Jalna and Amravati districts of Maharashtra suggested that the attitude of target clientele plays an important role in the acceptance of ICT-based interventions which make them knowledge-empowered. The study concluded that the need, preferences and attitude of the target group is perceived as key indicator in predicting acceptability of any technological intervention among the farming communities. (Wadkar *et al.,* 2016) [18]. However in another study carried by Ajijola *et al.,* in the year 2015 to predict that educational qualification is a predetermined factor in information assimilation, dissemination and adoption of technologies among rural farmers in diverse socio-economy. The major role in raising the productivity of crops and income of farmers is the educational a status which also increases his ability to understand and evaluate the information on new techniques and processes. In our neighbouring country Bangladesh Mymensing district study concluded the attitude and level of knowledge of farmers towards ICT as a source of information use in extension service delivery revealed that age, level of education, farming experience, farmers' perception on their information need and their level of knowledge have influence on farmers' attitude towards ICT based farming system. The Validated interview schedule was used for data collection and appropriate statistical tools were used to analyse the collected data. (Kabir, 2015) [10]. He also conducted in of on Simple random sampling technique was used in the selection of ninety (90) farmers as the sample of the study. Finally, while planning programs for the development of ICTs sector, policymakers should consider the above mention factors which could help towards the conversion of the traditional farming to ICT based farming and also for development in future Bangladesh. Furthermore, they had highly favourable attitude (58.9%) of Information and Communication Technology. In South Gujarat region to analyse the determinants of an attitude of the farmers towards Krishi Vigyan Kendra's (KVK) activities and to explore the relationship between attitude and profile of the farmers. (Parmar *et al.,* 2015). The present study revealed that out of nine independent variables, correlation coefficient had shown positive and significant relationship in case of variables namely, occupation, experience in farming, training received at KVK, scientific orientation and innovation while, non-significant relationship in case of age education, size of landholding and animal possession with the attitude of the farmers toward training organized by KVK. The farmers with progressive attitude always try to involve themselves in all activities through which more annual income can be achieved. Thus, studied determinants showed that the farmers are always optimistic and try to get maximum information and benefit from KVK activities.

A study for ICT shows a tool possible for the communication process, not a solution to solve the problem. The process followed by the researcher is more important than access and the content used is more relevant than the tools. Development is neither about technology nor is it about information**, (**Panda *et al*., 2014) [12]. It is about economic, social, and political empowerment. The access is related to tools, technologies and information. Instead, process is about the participation of the farmers, and the communication gaps to be filled, their needs and the local language to be identified and provide the information by a similar means.

In the year 2013, Arora and Rathore carried out a study in Udham Singh Nagar district of Uttarakhand to study the attitude of the user farmers and non-user farmers towards this programme by selecting of 220 farmers (110 users and 110

non-users) from the study area and concluded results that e-choupal has considerably provided some insights into the attitude of farmers towards the programme. The attitude of the users was better than that of the non-users towards e-choupal and it was recorded that majority of the users had moderately favourable attitude towards the ITC Ltd. sanchalak as well as services provided at the e-choupal, whereas comparatively less number of non-users felt so.

A study conducted in Madagascar by Henri *et al.,* 2012 for agricultural transactions by traders that recommended the need to educate older traders on the benefits of using mobile phones in agricultural transactions and to incorporate training ("learning by doing") based on the use of mobile phone tools (call, SMS, computing) in its promotional activities. One of the impediments to the ownership and use of mobile phones for agricultural transactions is age, with older traders less likely to use mobile phones.

The study revealed in the 24 Parganas district of West Bengal for finding the most dominant variables in influencing the attitude of fish farmers and concluded that knowledge, value orientation, Cosmo politeness, economic motivation, family type, innovative proneness, annual income, family size and size of water body reflected the strong association and effect with the nature of farmers. (Goswami, 2012), whereas for analysing the Kisan mobile advisory service in South Western Punjab and reported that the respondents within the middle-age category, medium and high level of education and medium scale farmers found Kisan mobile advisory useful as compared to other young and old age category, illiterate and small scale farmers who found the information as not useful. (Sandhu *et al.,* 2012)

In year 2012 Shankaraiah and Swamy revealed in Doddaballapura District of Karnataka concluded that since the concept of MMS network is a new approach in the transfer of technology and majority of the large-scale farmers are using MMS network, there is a need for extension activities to motivate small farmers for using MMS network. As perceived by farmers in the MMS network there is a lack of practical exposure and clarification is difficult in case doubts to arise. Hence, there is a need to find a new mechanism to solve this problem. Thirty- two percent of the farmers had most favourable attitude while 40 per cent of farmers had favourable attitude followed by 27.5 per cent who had a least favourable attitude towards MMS network.

In the Jordan Valley, the most important vegetable production area and found that some farmers accept and adopt the recommendations of these activities. The other hand, some people are not satisfied and consider these activities a waste of time for both the farmers and the government. There were conflicting attitudes towards the extension activities provided by the public sector. (Qtaishat and Sharafat, 2012).

Falola and Adewumi in 2011 identified that Ondo State, Nigeria, the factors affecting the use of mobile telephony by small-scale farmers and described the socio-economic and demographic characteristics of the farmers, examining their access to telecommunications services determines their frequency of using mobile telephony for agricultural activities as well as the factors affecting the use of the technology by the farmers. The farm income, household size, education and membership of association is positively related to the mobile usage of the farmers for agricultural production activities whereas the age of household head is negatively correlated with mobile usage, as one would expect younger generations to be more familiar with and accepting new technologies like mobile telephony, even though it may be the households with older the heads that are better able to afford them was concluded in the study.

A study conducted in Gujarat by Chauhan, 2010 [6] about the 'Farmers' Perception about ICT applications, found that farmers have positive attitude towards the use of Internet and perceive it as a rich source to collect world-wide information in latest agriculture practices and the fastest way to exchange information in shortest time to take quick decision. More than three-fourth of the respondents expressed their desire to use Internet daily or twice in a week by their own. It was also concluded that education, land holding, contact with NRI's, experience of internet use and mass media exposure are significantly and positively correlated with the opinion of the farmers about the use of Internet for farming community

In Bundi district of Rajasthan study was focussed on the attitude of farmers towards ICT Information as a source of information, had improved the decision making capability of the respondent farmers by providing alternative solutions to a set of a problematic situation and concluded that effective utilization of communication tools has the potential to make the rural communities prosperous by enabling the dissemination of required information in the user friendly format, easy to access and in cost-effective ways at the right time. (Dhaka and Chayal 2010)

Epilogue

Agriculture has suffered due to absence of modern capital and modern knowledge among the areas where ICTs are widely used in agriculture is information services on availability of inputs, quality of inputs, contacting middlemen for marketing of produce, pest management of main crops. Since there is an increased penetration in the level of availability and accessibility of ICTs farmers of the state, there is a need to ensure that the problems of the farmers are being met in order to enable the farming community derive maximum benefits on better access to information services through the use of ICTs for agriculture and other developmental purposes.. There is a need to liberalize agriculture to attract responsible private investments in production and market. In the last 50 years lot of research has been done in field of Agriculture, which has not been properly extended to the farmers. Information technology could be applied to as a means in extending the research works done by the ICAR institutes and SAU's.

There can be multiple factors such as lack of confidence in operating ICTs, erratic power supply, low network connectivity, lack of awareness of benefits of ICTs, lack of skill in handling ICTs, low ICT literacy, lack of repairing facilities, attitudinal barriers towards ICTs, poor finance, lack of training and practical exposure and insufficient regional language in the effective use of ICTs in IPM. The developed model would be able to find the access and usability of the most effective and popular means of disseminating the information to the tribal farmers of the North eastern India. Hence the information required by the farmers can be provided by the same media, which is easily available and accessible.

Suggestions

- Farmer Friendly ICT tools must be developed.
- ICT tools must be developed in local language
- Regular Training Cum awareness programme must be organized.
- ICT tools must have pictorials so to reach even illiterate neglected the tribal farmers.

- Useful information must be regularly updated.
- Regular feedback and midterm corrections must be done.
- ICT tools must be cost effective.
- A Network of end users, developers, policymakers and experts must be created.
- ICT tools must be easily available to the end client.
- Governmental and Non-Governmental agency must give some subsidiary.

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