THE SCOPE AND OPPORTUNITIES OF RECENT ADVANCES IN INFORMATION ANDCOMMUNICATION TECHNOLOGIES IN EXTENSION

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ABSTRACT

Information of the required quality always has the potential of improving efficiency in all spheres of agriculture. The emerging scenario of a deregulated agriculture, thanks to WTO, has brought in a greater 'need' and urgency to make it an integral part of decision making by Indian agricultural community. Information Technology (IT) has a major role to play in all facets of Indian agriculture. In addition to facilitating farmers in improving the efficiency and productivity of agriculture and allied activities, the potential of IT lies in bringing about an overall qualitative improvement in life by providing timely and quality information inputs for decision-making. The personnel who work for the welfare of Indian farmers, such as extension workers, do not have access to latest information, which hinders their ability to serve the farming community effectively. This paper focuses on the scope for e-powering people who live in rural India as well as those who work for their welfare. The latest developments in IT that facilitate effective IT penetration to rural India, changing pattern of information requirements & role of IT, type of systems required in the post-WTO environment, the bottlenecks in e-powering rural India along with possible solutions are examined.

Key Words: Information, Communication, Technologies, and Extension

INTRODUCTION

Agriculture continues to be the occupation and way of life for more than half of Indian population even today. Indian Agriculture had been on traditional lines till the first waves of Green Revolution in late 60s. The Green Revolution gave a sudden boost to the production and productivity of major cereals in the assured irrigated areas - The Punjab, Haryana and Western U.P. in north, and Godavari, Cauvery deltas in the south. Quick dissemination of Technological information from the Agricultural Research System to the farmers in the field and reporting of farmers' feedback to the research system is one of the critical inputs in transfer of agricultural technology. The information and communication support during last 55 years has mainly been conventional. The extension personnel of the Department of Agriculture disseminated the technological messages to the farmers manually. This approach has not been able to reach majority of the farmers who are spread across the whole country. This gap remains a challenge for the Extension system even today. To reach over 110 million farmers, spread over 500 districts and over 6000 blocks is an up hill task. The diversity of agro-ecological situations adds o this challenge further. The success of Green Revolution vas mainly achieved due to concerted homogeneous extension approach for the assured irrigated area. Now s we move to address the needs of rainfed eco-systems, he extension strategy becomes more complex. Farmers' eeds are much more diversified and the knowledge required to address them is beyond the capacity of the grass root level extension functionaries.

Across the globe, countries have recognized Information Technology (IT) as an effective tool in catalysing the economic activity in efficient governance, and in developing human resources. There is a growing recognition of the newer and wider possibilities that technology presents before the society in the modern times. IT together with communication technologies has brought about unprecedented changes in the way people communicates conduct business, pleasure and social interaction. The evolution of new forms of technologies and imaginative forms of applications of the new and older technologies makes the lives of the people better and more comfortable in several ways. There is even greater realization that instead of a single-track technology, lateral integration of technologies can deliver startling results and the world seems to be moving towards such converged systems.

A silent revolution is taking place in the communication systems in rural India. The swift emergence of a global 'information society" is changing the way people live, learn, work and relate. An explosion in the free flow of information and ideas has brought knowledge and its myriad applications to many millions of people, creating new choices and opportunities in some of the most vital realms of human endeavour. Timely access to news and information can promote trade, education, employment, health and wealth. The farmers

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and farm-families are browsing the net and getting general, technical and marketing information from the Information kiosks set up by a number of pioneers across the country. If the rural India can be connected and the "masses" are empowered with "Information", the Indian Economy will take a leap forward into the Digital Millennium with a great speed. The process has already started. The Government of India has already put a "IT Policy" in place in 2000, almost all the states have developed "IT Strategy" and have put these up on their web-sites. Technologies especially suitable for Rural Areas are being developed and deployed. Portals on Rural Markets and Agricultural Services are being hosted. District level Web Sites are being hosted, Information Kiosks are being established at block and village levels and the technical and other need-based information is being collected, digitised and hosted on the Internet.

ICTs are technologies offering new ways for communicating and exchanging information and knowledge. They can be used to enable, strengthen or replace existing information systems and networks. The challenge for those working in ICTs is to define the particular roles that information can be expected to play and where ICTs might be most effectively applied but equally to clarify and be honest about what they cannot do. Previous approaches to communication for development have exposed the failure of top-down, one-way, non-consultative, technology driven approaches to development communication. There are many examples of technology gathering dust in cupboards or being sold by communities to purchase goods they deemed more appropriate to their needs. Finally, projects have not taken into account the needs of marginalized groups and in particular technology-transfer projects in all their forms have historically lacked gender sensitivity (Appleton, 1995).

Today it is possible to find a solution to this situation by using the potential of Information and Communication technologies to meet the location specific information needs of the farmers. The information and communication networks are expanding very fast. The number of Internet connections in India has crossed the two million mark and the number of telephone connections is over 22 million. The Internet connectivity has touched almost all the districts in the country and is moving down to the block level. Pilot projects to connect rural community to the cyber-space are underway at various locations. The initial response of the rural people, particularly women, has been very encouraging. MANAGE has established Internet connectivity in 28 Districts in 7 States, namely Andhra Pradesh, Bihar, Himachal Pradesh, Jharkhand, Maharashtra, Orissa and Punjab under National Agricultural Technology Project (NATP). Over 200 blocks have already been connected on Internet under NATP.

A number of State Agricultural Universities, government departments and also some private entrepreneurs have hosted Agricultural Web Sites. The Agricultural Information Base on the Net is building up slowly but surely. MANAGE has taken the initiative to provide linkages to the technical and other farmer friendly information thru its Web Site. MANAGE is also supporting a number of Agricultural Universities and other research and training organisations, both in public and voluntary sector in building their capacity to digitise the Agricultural Information to digitise their technical information and host the same on the Web. The web-sites of 4 Regional Extension Education Institutes (EEIs), 6 State level Management and Extension Training Institutes (SAMETIs), 24 districts and many others organisations have been designed, developed and hosted by MANAGE. The web-sites of 28 districts (Agricultural Technology Management Agency, ATMAs), contain very important information on District Profile, Land Use Pattern, District Agriculture scenario, Strategic Research and Extension Plans (SREPs), replicable success stories, and information on important contact persons with their telephone numbers and e-mail-ids. These web sites have improved the information dissemination of these institutions significantly.

Improving Communication Capacity of Agricultural Extension System :

The weak linkages among extension, research, marketing network and farmers limits the effectiveness of research and extension to contribute to agricultural development. The Government of India has identified this problem, and is addressing it through national Programmes. The erstwhile emphasis on usage of vernacular press, radio and television for reaching to the farmers is being augmented with use of state-of-the-art communication technologies such as Internet and satellite communication. Under the new initiative of NATP, adequate attention is being paid to provide ICT connectivity down to the Block level. This connectivity will facilitate two-way communication among all the stakeholders in the Research-Extension-Marketing-Farmers loop. Apart from core Information and Communication Technology (ICT) connectivity, other forms of audio and visual communication like Satellite Communication (SATCOM) are also being promoted on project basis.

Research-Extension Communication in India - the Present Scenario :

The major medium of communication among the

research and extension agencies in India is still "Face-to-Face Communication". The DAC (Department of Agriculture and Co-operation)-ICAR (Indian Council of Agricultural Research) interface at the highest level provides the interaction platform for the policy makers in Department of Agriculture and Cooperation and the Senior Scientists of ICAR. Thus, the information and communication support during last 50 years has mainly been conventional. The extension personnel of the Department of Agriculture disseminated the technological messages to farmers manually. This approach has not been able to reach majority of the farmers who are spread across the whole country. This gap remains challenge for the extension system even today.

At the state level, similar mechanism exists in all most all the states, where the State Departments of Agriculture interact with the concerned State Agriculture Universities, Research and Extension Scientists to prepare plans for extension activities at field level. In some of the states, the SAUs have established extension centres at each district (Andhra Pradesh - DAATTC (District Agriculture Advisory and Transfer of Technology Centre of ANGRAU). There are few other mechanisms in between these systems. These include the interactions among research scientists and extension managers at Zonal Research Station Level and at Krishi Vigyan Kendra Level. Thus the research extension communication is mainly interpersonal, which is generally followed by technical literature from university side and field feedback (in written form) from extension side. This mechanism prevails in most of the states in India. Under NATP and UPDASP (Uttar Pradesh Diversified Agricultural Support Project) Internet based connectivity has been provided to the major stakeholders in research and extension systems in 46 pilot districts.

The basic communication flow consists of periodical reports to the project agencies and in some cases email communication between researchers and extension managers. The Project districts that have hosted their websites provide basic information about district, the agricultural pattern of the district, the strategic research and extension plan (SREP) and major initiatives under concerned projects. The universities have also hosted their websites and in some cases the ZRSs and KVKs have also done so. These websites are primarily serving as a ready reference for contacting the concerned agencies. They provide contact address, email address and telephone number of important scientists. The technical material on the university websites is of very general nature. The material is however very useful for the university scientists placed at ZRS and KVK levels and extension personnel at the district level. This can be considered as the phase-1 of using information communication technology for agricultural extension. The second phase of this initiative will include e-enabling the research extension communication process in dynamic sense. This will involve re-engineering of existing communication mechanism at various levels.

ICTs will augment, in big way, the reach and two-way interaction among the key stakeholders. The new technology offers new opportunities. It will add more interactivity. It will add speed. It will add two-way communication. It will add to wider age and also more in-depth messaging. It will widen the scope of extension; it will also improve quality. It will subtract costs and reduce time. It will reduce dependency on so many actors in the chain of extension system, and frankly it will change the whole method of extension in coming decade. "The continuing rapid development of telecommunications and computer-based information technology (IT) is probably the biggest factor for change in extension, one which will facilitate and reinforce other changes. There are many possibilities for the potential applications of the technology in agricultural extension" (FAO, 1993; Zipp, 1994). IT will bring new information services to rural areas that farmers, as users, will have much greater control than over current information channels. Even if every farmer does not have a computer terminal, these could become readily available at local information resource centres, with computers carrying expert systems to help farmers to make decisions. However, it will not make extension worker redundant. Rather, they will be able to concentrate on tasks and services where human interaction is essential - in helping farmers individually and in small groups to diagnose problems, to interpret data, and to apply their meaning (Leeuwis, 1993). The researchers at university now should involve the Krishi Vigyan Kendras, extension functionaries and even the farmers right from the beginning of the project. They can share their objectives, their methodology of research, methodology of analysis and also the observations and intermediate results with the concerned fellow scientists and the interested farmers. In this open system, the other stakeholders can give their feedback and their suggestions to the researchers at every stage of the experiment. In some cases, even the farmers can participate in adoptive research. The validation of research can definitely be done at an appropriate number of locations within the concerned agro-eco-zone, with the results of the same being shared among all stakeholders online, at various stages of research.

Reaching the Last Mile-Connecting the Farmers :

The concept of "Village Information Shops" is being

discussed, debated and experimented in India at various places. Experiments of Dr. M.S. Swaminathan Research Foundation (MSSRF), Chennai, 'Information-Villages' of MANAGE in Ranga Reddy District in A.P., Gyandoot.net initiative of District Administration Dhar, M.P., EID-Parry's Wireless in Local Loop based Village Kiosks in Cuddalore District of Tamilnadu and 'Warna Wired Villages' of National Informatics Centre (NIC) in Kolhapur-Sangli Districts of Maharashtra are some of the cases which provide good insight of Farmers and farm-families' information needs and paying capacity. Preliminary results indicate that, 'Agricultural Extension' alone is not sufficient to sustain 'Information Shop' at village or even at Block level. The information supply domain has to be much larger and dynamic so as to offer value-adding information like market prices, local topical information like bus and railway timetables, weather forecasts etc. The experiences of Gyandoot (Dhar) indicate that the 'Village Information Kiosk' can be self-sustainable enterprise (with a potential to provide job for two young rural people at each kiosk), if 'e-governance' services are integrated with the Information Network. The rural people are willing to pay for the information services, provided the services are a little more exhaustive and improve their livelihoods. The 'Extension' information is very important component of the information needed at the village level. The quality and content have however to change quite drastically to make the extension information farmer friendly.

IT and Indian Agriculture in the Future :

Technologically it is possible to develop suitable systems, as outlined in the previous sections, to cater to the information needs of Indian farmer. User friendly systems, particularly with content in local languages, can generate interest in the farmers and others working at the grassroots. It is possible to create dedicated networks or harness the power of Internet to make these services is available to all parts of the country. The task of creating application packages and databases to cater to complete spectrum of Indian agriculture is a giant task. The Long Term Agriculture Policy provides an exhaustive list of all the areas that are to be covered. This can be taken as a guiding list to evolve design and develop suitable systems catering to each of the specified areas. Our country has the advantage of having a large number of specialised institutions in place catering to various aspects of Indian agriculture. These institutions can play a crucial role in designing the necessary applications & databases and services. This will facilitate modularisation of the task, better control and help in achieving quick results. As it is, several institutions have already developed systems related to their area of specialisation. For quick results, it may be useful to get the applications outsourced to software companies in India. This will facilitate quick deployment of applications and provide boost to the software industry in India. In order to avoid duplication of efforts, it may be useful to consider promoting a coordinating agency, which will have an advisory role to play in evolving standard interface for users, broad design and monitoring of the progress. In the post WTO regime, it is suggested that it is useful to focus more on some agricultural products to maintain an unquestionable competitive advantage for exports. This will call for urgent measures to introduce state of the art technologies such as remote sensing, geographical information systems (GIS), bio-engineering, etc. India has made rapid strides in satellite technologies. It is possible to effectively monitor agricultural performance using remote sensing and GIS applications. This will not only help in planning, advising and monitoring the status of the crops but also will help in responding quickly to crop stress conditions and natural calamities. Challenges of crop stress, soil problems, and natural disasters can be tackled effectively through these technologies. A beginning in precision farming can be encouraged in larger tracts of land in which export potential can be tilted in our country's favour. While developing these systems it is necessary to appreciate that major audience that is targeted is not comfortable with computers. This places premium on user friendliness and it may be useful to consider touch screen technologies to improve user comfort levels. It is often observed that touch screen kiosks, with their intuitive approach, provide a means for quick learning and higher participation. It is also necessary to provide as much content as possible in local languages. Once the required application packages & databases are in place, a major challenge is with respect to dissemination of the information. The Krishi Vigyan Kendras, NGOs and cooperative societies may be used to set up information kiosks. Private enterprise is also required to be drawn into these activities. These kiosks should provide information on other areas of interest such as education, information for which people have to travel distances such as those related to the government, courts, etc. Facilities for email, raising queries to experts, uploading digital clips to draw the attention of experts to location specific problems can be envisaged.

CONCLUSION

The Indian farmer and those who are working for their welfare need to be e-powered to face the emerging scenario of complete or partial deregulation & reduction in government protection, 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 inputs, which provide better decision-making abilities. IT can play a major role in facilitating the process of transformation of rural India to meet these challenges and to remove the fast growing digital divide. The rapid changes in the field of information technology make it possible to develop and disseminate required electronic services to rural India. The existing bottlenecks in undertaking the tasks need to be addressed immediately. A national strategy needs to be drawn for spearheading IT penetration to rural India. A national coordinating agency with an advisory role can act as a catalyst in the process. No single institution or organisation alone can succeed in the task of e-powering farmers and rural India. At the same time, scattered and half-hearted attempts cannot be successful in meeting the objective. Industries with major stake in villages, such as fertilizer sector, should come together to provide the initial impetus. The success of any IT based service to rural India hinges on evolving a proper revenue model for the dissemination points. The information kiosks can draw revenue from the industry by providing and disseminating required services. Once these dissemination points prove to be economically viable, the IT revolution in rural India will require no crusaders.

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