

A Study on Information and Communication Technology in Agricultural Growth

Naresh Kumar .D

MBA, Department of Management Studies
Bharath Institute of Science and Technology,
Selaiyur, Chennai, Tamil Nadu 600 073
Bharath Institute of Higher Education and Research

ABSTRACT

Today a new paradigm of agricultural development is fast emerging: in both developing and developed countries the overall development of rural areas is expanding in new directions; old ways of delivering important services to citizens are being challenged; and traditional societies are being transformed into knowledge societies all over the world. The report of the 'Task Force on India as Knowledge Superpower' (GOI, 2001) emphasised the necessity of developing the capacity to generate, absorb, disseminate and protect knowledge and exploit it as a powerful tool to derive societal transformation. Information and Communication Technology (ICT) is seen as an important means of achieving such a transformation. When used as a broad tool for providing local farming communities with scientific knowledge, ICT heralds the formation of knowledge societies in the rural areas of the developing world. However, this can only be realised when knowledge and information are effectively harvested for overall agricultural and rural development. The development of precision farming in countries of the North emphasizes knowledge-intensity; hence the agricultural paradigm in the developing world will have to be recast to take advantage of knowledge availability to achieve multiple goals: of income, food, jobs, etc. ICT has a significant role to perform in evolving such a paradigm, as was evident from the Interdisciplinary Dialogue on IT: Reaching the Unreached (Swaminathan, 1993).

1. ICT IN THE REVIVAL OF SOCIAL ORGANISATIONS

ICT can give a new impetus to the social organizations and productive activity of agriculture which, if nurtured effectively, could become transformational factors. The 'knowledge' itself will become a technology for overall agricultural development. Agricultural extension, in the current scenario of a rapidly changing world, has been recognized as an essential mechanism for delivering knowledge (information) and advice as an input for modern farming (Jones, 1997). However it has to escape from the narrow mindset of transferring technology packages to transferring knowledge or information packages. If this can be achieved, with the help of ICT, extension will become more diversified, more knowledge-intensive, and more demand driven, and thus more effective in meeting farmers' information needs. ICT has many potential applications in agricultural extension (Zijp, 1994). It can bring new information services to rural areas where farmers, as users, will have much greater control than before over current information channels. Access to such new information sources is a crucial requirement for the sustainable development of the farming systems.

CONVERGENCE OF ICT WITH AGRICULTURAL DEVELOPMENT

Broad basing agricultural extension activities; developing farming system research and extension; having location-specific modules of research and extension; and promoting market extension,

sustainable agricultural development, participatory research, etc. are some of the numerous areas where ICT can play an important role. Several research studies conducted on extension organizations have revealed that the delivery of goods is effective when the grass roots extension worker covers a small area of jurisdiction, with multiple purposes (broad basing). The existing system of large jurisdictions, each with a narrow range of activities, is less effective. However, broad basing requires grass roots workers to be at the cutting edge of extension and master of many trades, which is not really possible. IT can help here, by enabling extension workers to gather, store, retrieve and disseminate a broad range of information needed by farmers, thus transforming them from extension workers into knowledge workers. The emergence of such knowledge workers will result in the realization of the much talked about bottom-up, demand driven technology generation, assessment, refinement and transfer. Agricultural extension systems in most developing countries are under-funded and have had mixed effects. Much of the extension information has been found to be out of date, irrelevant and not applicable to small farmers' needs, leaving such farmers with very little information or resources to improve their productivity. ICT helps the extension system in re-orienting itself towards the overall agricultural development of small production systems. With the appropriate knowledge, small-scale producers can even have a competitive edge over larger operations. When knowledge is harnessed by strong organizations of small producers, strategic planning can be used to provide members with least-cost inputs, better storage facilities, improved transportation links and collective negotiations with buyers. ICT can also play an important role in bringing about sustainable agricultural development when used to document both organic and traditional cultivation practices. Developing countries can create Traditional Knowledge Digital Libraries (TKDL) to collect and classify various types of local knowledge so that it can be shared more widely. These libraries could also integrate widely scattered references to Indigenous Technical Knowledge (ITK) systems in a retrievable form. Thus IT could act as a bridge between traditional and modern knowledge systems.

AREAS OF ITS CONVERGENCE

Applications of IT in support of agricultural and rural development fall into five main areas, as outlined by Don Richardson (FAO, 1996). These are:

- economic development of agricultural producers;
- community development;
- research and education;
- small and medium enterprises development; and media networks. Some agricultural development services that can be provided in the developing world, using ICT, are:
- online services for information, education and training, monitoring and consultation, diagnosis and monitoring, and transaction and processing;
- e-commerce for direct linkages between local producers, traders, retailers and suppliers; the facilitation of interaction among researchers, extension (knowledge) workers, and farmers;
- question-and-answer services where experts respond to queries on specialised subjects
- ICT services to block- and district-level developmental officials for greater efficiency in delivering services for overall agricultural development;
- up-to-date information, supplied to farmers as early as possible, about subjects such as packages of practices, market information, weather forecasting, input supplies, credit availability, etc.;

- creation of databases with details of the resources of local villages and villagers, site-specific information systems, expert systems, etc.;
- provision of early warning systems about disease/ pest problems, information regarding rural development programmes and crop insurances, post-harvest technology, etc.;
- facilitation of land records and online registration services;
- improved marketing of milk and milk products;
- services providing information to farmers regarding farm business and management;
- increased efficiency and productivity of cooperative societies through the computer communication network and the latest database technology;
- tele-education for farmers;
- websites established by agricultural research institutes, making the latest information available to extension (knowledge) workers and obtaining their feedback.

ICT INITIATIVES FOR AGRICULTURAL DEVELOPMENT IN INDIA

There have been some initiatives in India, using ICT for agricultural development. In most of these projects, agriculture is only a small component. Indian experiences with IT projects are:

- Gyandoot project (Madhya Pradesh);
- Warana Wired Village project (Maharashtra);
- Information Village project of the M S Swaminathan Research Foundation (MSSRF) (Pondicherry);
- iKisan project of the Nagarjuna group of companies (Andhra Pradesh);
- Automated Milk Collection Centres of Amul dairy cooperatives (Gujarat);
- Land Record Computerisation (Bhoomi) (Karnataka);
- Computer-Aided Online Registration Department (Andhra Pradesh);
- Online Marketing and CAD in Northern Karnataka (Karnataka);
- Knowledge Network for Grass Root Innovations – Society for Research and Initiatives (SRISTI) (Gujarat);
- Application of Satellite Communication for Training Field Extension Workers in Rural Areas (Indian Space Research Organization); In addition to the above, a few non-governmental organizations (NGOs) have initiated ICT projects such as:
- Tarahaat.com by Development Alternatives (Uttar Pradesh and Punjab);
- Mahitiz-samuha (Karnataka);
- VOICES – Madhyam Communications (Karnataka);
- Centre for Alternative Agriculture Media (CAAM); some exclusive agricultural portals are also available, such as:
- Haritgyan.com
- Krishiworld.net
- TOEHOLDINDIA.com
- Agriwatch.com
- ITC's Soyachoupal.com
- Acquachoupal.com
- Plantersnet.com, etc.

Despite the huge potential to harness ICT for agricultural development, only a few isolated projects have been initiated in India and a few in other parts of the world. Interestingly, many of these projects were started by NGOs, private organizations, cooperative bodies and governmental

organizations other than agricultural departments. This shows the apathy of agricultural development departments towards incorporating ICT into their day-to-day activities. To formulate a strategy for overall agricultural development, the isolated ICT projects need to be studied and the experiences generated must be documented in order to draw lessons for the future.

2. CONCLUSIONS

Efforts should be made to incorporate ICT in all endeavours related to agricultural development. The organizations and departments concerned with agricultural development need to realize the potential of ICT for the speedy dissemination of information to farmers. Government at national and state level in India has to reorient agricultural policies so that a fully-fledged strategy is formed to harness ICT's potential for assisting overall agricultural development. Generating awareness among young and middle-aged farmers about the availability of ICT services is the first step to be considered to increase farmers' participation in ICT initiatives. In the case of well endowed areas where cooperative setups are prevalent, ICT initiatives should focus on providing services such as question-and-answer sessions, cooperative-related accounting methods, market information, input prices/availability and early warning systems for disease and pest problems. Where commercial farmers are dominant, as in the iKisan area, ICT services should provide early warning of disease and pest problems, question-and-answer services, information on cropping systems and planning, best and latest packages of practices for commercial crops, weather forecasting, soil testing and sampling, post-harvest technology, input prices/ availability, farm business information and crop insurance. Older farmers should be brought into the chain of ICT networks at a later stage. Also, since small and marginal farmers are using ICT services, more emphasis should be given to providing information relevant to their farming systems. Strong interfaces should be developed at village level so that the problem of computer illiteracy among farmers may be resolved. User-friendly software, graphic interfaces and pictorial information would encourage more IT use.

3. REFERENCES

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