

## ICT FOR AGRICULTURAL AND RURAL DEVELOPMENT

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### ABSTRACT

Rural development encompasses the development of agriculture, socio economic infrastructure and human resources in rural areas. For this development communication has to emerge as an important policy instrument integrating economic, social, education and cultural planning. The electronic mass communication has been considered as a potential agency for development of people. This paper comprehensively reviews the different types of electronic media. It discusses in detail about the simple, advanced and modern electronic media. Simple media like radio, television are accorded as most credible, reliable and farthest reaching communication techniques. Advanced electronic media like Interactive computer video technology (ICVT) fulfils the need of the interaction in the communication process and increases the quality of extension process. Computer Aided Agricultural Extension (CAEx) and Information Village (IV) blend traditional and recommended technology to generate and disseminate information relevant for the rural areas locally. Information and Communication Technologies (ICT) is extensive and pervasive in their application to agriculture and rural development. Innovation of this are KIOSKS, use of GIS, e- library etc. Rural cams like corn and dairy cams are useful technologies for dissemination using the concept of virtual farming. E -agricultural markets provides the farmers with services like acquiring of seeds , fertilizers, pesticides etc. Modern electronic media like Video text, teletext, and interactive multimedia are some other modern media. Interactive multimedia permits people to learn interactively using real situation. In near future, the concentrated and coordinated efforts of media like internet, videotext, teletext etc. with their appropriate combination could be effectively used in disseminating newly developed agricultural and dairy innovations to the prospective beneficiary farmers.

### INTRODUCTION

Rural is essentially agricultural, its settlement system consists of villages or homesteads, socially it connotes greater interdependence among people, more deeply rooted community life , and occupationally it is highly dependant on crop farming, animal keeping, tree crops and related activities (Mishra and Sundaram, 1970).

As a concept, rural development connotes overall development of rural areas with a view to improve the quality of life of rural people. In this sense, it is a comprehensive and multidimensional concept and encompasses the development of agriculture and allied activities, village and cottage industries, socio-economic infrastructure, community services and facilities, and above all the human resources in rural areas.

### RESEARCH METHODOLOGY

In order to bring about development and

enhance the quality of life of the villagers a definite policy with regard to communication support must be formulated and pursued. Communication has to emerge as an important policy instrument, integrating economic, social, education and cultural planning (Joshi, 1985). In India from the very beginning media has been designated as "catalytic agents" for rural development and social change and is considered as a solution to the problems of development of the agrarian Indian society. A research carried out by Lerner (1958) gave evidence that the media can induce developmental changes in traditional societies. Further research findings by Rogers and Schramm (1964) confirmed Learner's thesis that the quickest way to change traditional societies was through the mass media. Lerner sees the modernization or development process as the movement of a society along a traditional - modern continuum. Between these two poles are the transitional societies. The movement of traditional societies towards the modern end of continuum has

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been explained by Lerner in terms of four keys variables, viz. Urbanization, Literacy, Mass media exposure and Participation. In urban societies, the acquisition of literacy as a skill becomes both possible and necessary. Increased literacy, in turn, leads to greater exposure to the mass media which reciprocates by creating a further demand for literacy. The media then, stimulates wider participation in the economic, political, social, cultural and other spheres of life. So, to gear up this development for modernization, use of media is an important factor. Media is considered as a solution to the problems of development of the agrarian Indian society. The electronic mass media is considered a major tool for the development of people primarily due to its reach and secondly can transfer the improved agricultural practices to the farmers at different stages of adoption process. An attempt has been made here to discuss the current status of the use of these electronic media with particular reference to their application in the field of agricultural and rural development. These electronic media are categorized into three broad groups. They are simple electronic media, advanced electronic media and other modern electronic media.

## RESULTS AND DISCUSSION

### 1) Simple Electronic Media

These media involve complexities to lesser extent in their operation and maintenance as compared to others. Hence these are known as simple electronic media. These can be listed as Radio, Television, Satellite technology and Video and audio tapes.

#### Radio

Radio broadcasting in India started since 1927 and the All India Radio (AIR) was established in 1936 that became "Akashwani" in 1957. In 1965, ten intensive Farm and Home units were established at selected AIR stations to feed factual and technical information and utility announcements to the farming community. There are 120 million estimated radio sets in India. Radio coverage in India is about 99.13% of population and reaches 91.42% of area (Anonymous, 2006).

Radio is the cheapest, fastest and farthest reaching technique for beginning a communication

process and commands a universal audience. Farmers accord a very high credibility to it as a source of reliable and latest farm technology for them. Mahajan (1990) also stated the same for rural women irrespective of their socio - economic status and literacy level.

Radio overcomes the barriers of space and time. Radio has the advantage of being the first - hand experience of an authority on a subject within the reach of every radio listener. Radio plays a great role at two stages i.e. awareness and interest generation among the farm families and for giving valuable information (Atwal, 1972). In order to increase extensive reach, effectiveness, popularity and acceptability of radio, now the concept of 'local radio broadcast' has been observed to be more effective. The All India Radio started first of this kind of local radio station at Dageroli in Kanyakumari district of Tamilnadu in October 1984.

Radio Rural Forum is a combination of the mass media with interpersonal communication, where small organized groups of individuals meet regularly to receive a mass media programme and discuss its contents and forward their queries to be answered by the original broadcaster or the expert through the convener who keeps the records and seeks answers to the queries. Thus, radio forums are helpful in generating greater awareness, creating conviction and developing positive attitude among farmers and rural youth about the innovative farm technologies.

Radio programmes must be flexible and spontaneous to enable it to function as mouthpiece of the local community. The programmes should satisfy the local aspiration of the people to whom such station or forums serve.

#### Television

Dr. Vikram A. Sarabhai was the first to accord highest priority to taking television to India's villages. Television was first seen in India in an industrial exhibition held at Delhi during 1955. In the words of Schramm (1953) "people would certainly learn from television and learning from television would not remain confined to facts only, but it extends to development of skills, critical thinking and problem solving". It is called as the "wonder child of the world". It is advantageous as

it can communicate to the viewer through both audio and visual aids. It transfers the messages immediately and has a wide coverage in terms of area. Dale (1963) pointed out that an agricultural expert could influence more farmers by ten minutes of telecast than a week's travel.

**Krishi Darshan.** It is the oldest, well established and best known program for the rural areas and farmers. It was started from 26th January, 1967 through the agricultural television pilot project. The foresight and the pioneering spirit of the visionary space scientist, Dr. Vikram Sarabhai and the initiative of Dr. M.S. Swaminathan crystallized it into the innovative program. The basic objective of the project was to communicate latest scientific know - how in agriculture, dairying and animal husbandry to the farmers. The regular farm telecast of Krishi Darshan commenced from 2nd February 1967. The access to TV by rural people is limited to 1.57 lakh in villages (Anonymous, 2006). The audience research unit of Doordarshan conducted a survey on television ownership and found that Punjab and Haryana account for 4 per cent of rural population but have 13 per cent rural TV sets (Joseph, 1997). Prakash and Sinha in 1998 observed that majority (56%) of dairy farmers used television for getting the information on scientific dairy farming practices. Lionberger (1958) studied the impact of TV programmes and reported that television had an impact on farmers in decision making, to change farm practices and the purchase of farm inputs.

#### **Satellite Instructional Television Experiment (SITE)**

The Satellite Instructional Television Experiment conducted during 1975 - 76, using the ATS-6 satellite loaned to India by the National Aeronautics and Space Administration (NASA) of USA was the convincing demonstration of the commitment of Indian Space and Research Organization (ISRO) to the rural development in all its dimensions and manifestation. This project involved the direct transmission of instructional programme to augmented TV sets in 2400 villages spread across the six Indian states.

The programmes telecasted under SITE covered areas such as agriculture, animal husbandry, family planning, education and other

development related issues as well as entertainment. The first six states where it started were the Rajasthan, Bihar, Orissa, Madhya Pradesh, Karnataka and Andhra Pradesh. SITE was considered a learning experience to design, produce and telecast relevant educational and developmental programmes to widely dispersed areas with different problems and varying languages, using on a time sharing basis, a single broadcast channel of ATS-6 satellites hailed as "a teacher in the sky". A study on the impact of SITE carried out by the ISRO revealed that instructional programme blended with entertainment could make a significant impact on the rural society in a variety of ways. Direct broadcasting under SITE made it possible to take the programme to remote rural areas. The Kheda Communication Project (KCP) launched in 1985 was being managed by the Development and Educational Communication Unit (DECU) of ISRO. It had the specific purpose of promoting rural development and social change. The KCP, which came to an end in 1990 has received UNESCO's award for rural development in 1985.

**GRAMSAT Satellite.** GRAMSAT satellite is tailor-made to meet the basic requirements of rural areas for disseminating culture and region specific knowledge on health, hygiene, environment, family planning, better agricultural practices. GRAMSAT includes six to eight high powered C-band transponders and two to three very high power Ku-band transponders. Satellite would offer them adult education, modern farming techniques and vocational education for updating the workers. In words of Professor V.R. Rao, former Chairman of the Indian Space Research Organization (ISRO), "Inherent in the adoption of satellite based technology which allows for 'interactive processes' and its capability to transform entire societies through its powerful characteristics in terms of immediacy, omnipotence, visual power and widest possible reach".

#### **Video Tapes and Audio Tapes**

Video is another suitable medium for generating and promoting interaction. It is an electronic motion picture with attendant sound. Both picture and sound reach an eye and ear simultaneously to make the message more effective.

It can be easily handled and at the same time easy to carry. Video tapes are an ideal medium to promote motivation, attitudinal change, behavior reinforcement, community participation and entertainment. Videotapes have tremendous utility in the training of extension personnel. Videotapes can be recorded on successfully conducted training sessions and workshops. Different 'success stories' can be of great practical use to our trainers. Another very promising area of videotape recording is technology training. The most successful mixes of training methods and technologies can be videotaped and sent to Directorate of Extension (DOE). The DOE can multiply them and send to states and training institutions at national, regional, state and even divisional level.

The National Dairy Research Institute (NDRI) in collaboration with Memorial University of Newfoundland, Canada took rural development action research project in the village of Taparana at Karnal in Haryana extensively using video in various contexts. Communication centers of several agricultural universities and private organizations have begun to produce and supply prerecorded audio and video cassettes. The Punjab Agricultural University gave a lead in this regard by releasing the first prerecorded audio cassette in September 1985 on the occasion of Kisan Divas.

## 2) **Advanced Electronic Media**

These are those media in which relatively more technicalities are involved in their operations and maintenance. The advanced electronic media includes Interactive Computer Video Technology (ICVT), Computer aided system (CAS), Information and Communication technologies (ICT) and Internet.

### **Interactive Computer Video Technology (ICVT)**

ICVT is the result of advancements in computer, video and laser technology. It is an amazing device for the storage and retrieval of audio and video information. ICVT fulfills the needs for the interaction in the communication process. In this, the learner controls the system through computers for his interaction with video recorded materials chosen for learning. This provides the opportunity for remediation as well as reinforcement

of learning and individualization of instruction.

For the first time in India in agriculture sector, Department of Electronics (DOE) has decided to take up a pilot project on the use of Interactive Computer Video Technology (ICVT) system at a cost of about Rs. 1.5 crores. The system was installed at MANAGE, Hyderabad on pilot project basis. The objective of this project in nutshell is concerned with adopting, testing and evaluating ICVT methodologies and technologies in Indian conditions. To fulfill these objectives and opening a new chapter in training to extension personnel, one firm named National Informatics Centres (NIC), New Delhi has taken the contract. This is believed to be first centre of its kind in any developing countries in agriculture sector.

### **Computer Aided Agricultural Extension (CAEx)**

The Chennai Dialogue on Information Technology (1992) chaired by Dr. M. S. Swaminathan, resulted in the proposal for the establishment of a Computer Aided Agricultural Extension (CAEx) and Information Village which will complement and sustain each other. Key of these schemes is the concept of blending traditional and recommended technologies to create a paradigm where technology development results in creation of new or skilled jobs. The purpose of CAEx is to generate and disseminate information relevant for a locality such as development block and village cluster. Here, local specificity is important.

The CAEx system centres around a value adding programme which receives information from a variety of sources such as the universities, the relevant State Departments, regional meteorological centres, KVKs, input agencies using different electronic media. Value addition of the received information takes place through creation of database with multimedia features (integrating audio/video, still images and text in one application).

CAEx can generate and disseminate information relevant for a locality in different areas viz., meteorological information, pest/disease information, marketing price information, weather report (remote sensing data), general and specific scientific information on different enterprises like aquaculture, apiculture, water harvesting, etc.

### **Information and Communication Technologies (ICTs)**

ICTs are a generic technology, their application to agriculture and to rural development are very extensive and pervasive. The facilitation of access to information and to knowledge is its main characteristic. They are profoundly transforming extension services through the use of multimedia technology, as well as through the possibility of developing innovative approaches based on interactive knowledge development processes that involve researchers, extension specialists and farmers. The main objective of ICT application, from a development perspective, is that of empowering people through knowledge. It increases the effectiveness of their development efforts through informed decision making and through their capacity to harness science and various forms of knowledge to achieve the objectives of poverty eradication, food security and sustainable development. The five key services proposed by Bhatnagar (2000) to analyze ICT application and their contribution to agricultural and rural development are:

- ❑ Access to information through different types of Agricultural Information Systems (AIS) e.g. village KIOSKS, e-Panchayat, cyber extension.
- ❑ Monitoring the situation of natural resources and impact through analysis of environment deterioration, soil erosion, deforestation etc. e.g. Geographical Information System (GIS).
- ❑ Education and communication technologies that are playing a very important role in generating new approaches to learning and to knowledge management e.g. e-Library.
- ❑ Networking where ICTs can contribute greatly in relating people or institution among them and facilitating the emergence of "virtual communication of stake holders" that generate and exchange information and knowledge among themselves.
- ❑ Decision support system (DSS): Tools and practices through which data and information provide relevant knowledge inputs for informed decision making. E.g. expert system.

### **Potential of Internet: E-Agriculture**

The term e-Agriculture refers to the using of

IT application such as computers, networking, and database systems to reduce knowledge gaps and increase knowledge sharing for increasing productivity and boosting growth in rural areas. It also helps in empowering farmers with relevant and timely information about different agricultural operations.

Rural Portal. Internet can go a step further by providing the individual solution round the clock in local languages by creating knowledge tree using audio and video clippings. Rural portal is envisaged as a search engine that can act as a guide to the existing agriculture related web information and web services. It supports to locate relevant information on the portal or other farming rural website via the area wise classification. Agriculture extension department should focus on providing agricultural information in e - format over World Wide Web (WWW) via internet. Some important websites are [www.kisan.net](http://www.kisan.net), [www.agriwatch.com](http://www.agriwatch.com), [www.agrisurf.com](http://www.agrisurf.com) etc. Regional extension centers can take responsibility for small vertical segments of agricultural information and develop corresponding websites e.g. Rajasthan government has launched a pilot project on ground water information about the ground water availability in the selected locations. Through rural portals farmers can easily seek answers to cropping strategy for farmer's field based on integrated information on soil, weather, fertilizer and pest management models, how and from where to get proper seeds or nursery plants and prevailing prices of the various farming tools and machines.

Rural Cam. A web cam is a device that sends picture from a video or still camera onto the internet so one can view the images on someone's web page. When web cam is used for the benefit of farmers, it is called rural cam. For example: A corn cam monitors a corn field and a dairy cam monitors dairy operations. This concept can be called as 'virtual farming.' Web cams can be useful for farmers by viewing live pictures from experimental field locations around the world on internet. Farmers can compare their field's response with the experiment field's response altogether different from what farmers are getting. Web cams can prove to be a useful technology for dissemination of new technology to a large group of farmers over the

internet and also be useful to educate farmers about the diagnosis and treatment for new pests and diseases.

E-Agricultural Markets. Farmer's needs vary with season, crop, weather and location. Therefore, most of agribusiness services need to be regional in scope. Many farmers do not have much of time or information access to make and implement informed marketing decisions since commodity prices keep on changing. The farmers can get information on comprehensive grain marketing and risk management programs from any e - commerce site based on agriculture just by clicking on a link. This also gives the farmers peace of mind and ability to concentrate more on producing their crop. Acquiring inputs like seeds, fertilizers, pesticide, agricultural implements, etc. is possible via e - agricultural markets from anywhere in the world.

### 3) Other Modern Electronic Media

Videotext, Tele Text and Interactive Multimedia

#### Video Text

It refers to an information system with which text and graphic information is transmitted and then received either by a video text television or on an ordinary television set with an adapter unit. The concept has been developed to provide a method of low cost information delivery. A video text coupled with a micro computer permits editing as well as retrieval of information on a video text page. The video text that is transmitted via telephone calls, cable data lines or private network is called as interactive video text. Videotext has certain attributes which makes it a potential teaching medium. It can be effectively used in training and distance education.

#### Tele Text

The videotext transmission based on broadcast signals is called teletext. Thus, teletext is a system that links a computer to a television by which text and graphic information can be transmitted on a one way basis to home viewers. Indian television joined the advanced nations when in 1985; it started the teletext, known as "Intex service", to telecast latest news and information, share market, etc.

#### Interactive Multimedia

The combination of computer and video has resulted in a remarkable new educational technology i.e. Interactive Multimedia. A major benefit of this technology is that it permits people to learn interactively using real situations, at a time, pace and location suitable to the learners. It reduces learning time, increases learner retention and reduces training cost.

#### CONCLUSION

The emergence of electronic media has revolutionized communication process. An array of these new electronic technologies is already in use or has tremendous potential for use in agricultural development. Interactive computer video technology (ICVT) fulfils the need of the interaction in the communication process that undoubtedly increases the quality of extension process. The potential use of audio and video tapes in agricultural development has been exploited by various institutions. Information obtained through satellite on crop, soil and water resources can enable us in planning for integrated land use development.

In near future, the concentrated and coordinated efforts of media like internet, videotext, tele-text, etc. with their appropriate combination could be effectively used in disseminating newly developed agricultural and dairy innovations to the prospective beneficiary farmers. These advanced communication technologies can play a crucial role in the transfer of improved agricultural innovations at a faster pace and at a learner centered location leading to agricultural and rural development.

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