

CYBER EXTENSION IN THE CONTEXT OF AGRICULTURAL EXTENSION IN INDIA

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Access to information and improved communication is a crucial requirement for sustainable agricultural development. Modern communication technologies when applied to conditions in rural areas can help improve communication, increase participation, and disseminate information and share knowledge and skills. It is being said that “Cyber Extension” would be the major form of technology dissemination in the near future. However it is observed that the rural population still has difficulty in accessing crucial information in order to make timely decisions. It is essential that information availability is demand driven rather than supply driven. The challenge is not only to improve the accessibility of communication technology to the rural population but also to improve its relevance to local development.

The advent of INTERNET on communication scenario offers enormous potential for two-way on-line communication between distant parties via the telecommunication and computer network spread over the entire globe. The world is rapidly shrinking to a ‘global village’, which some courageously even call a ‘global family’. The merger of communication (audio and video) and computer technology has suddenly made this combination so powerful that no sector of human activity can afford to ignore it.

In United States most of the extension agents at the county level (equivalent to districts in India) have e-mail access. All the agents thus have electronic access to the university professors right at their work place. The use of e-mail has virtually replaced the paper mail communication between the university and the extension agents. At the county extension office and regional research stations of the university the Internet facility is available to all the staff. This trend is noticed in other developed countries as well. Electronic connectivity is creating a New World order. There is a growing recognition of information connectivity have’s and have-nots. The developing countries have to take note of this situation and prepare themselves at the earliest to join the new paradigm of economic and social development.

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According to Professor Frank Webster of University of Birmingham, “ In the new global society, there is very little any individual government can do to effect economic development at a macro level. What it can do is educate its citizenry in information technologies so that they have a better than average opportunity to prosper and take advantage of the new global economy. Societies that manufacture the most educated citizenry will create infrastructure for the most prosperous economies. For that reason the Prime Minister of U.K. is focussing on education, but so too is the Chief Minister of Andhra Pradesh, the Governor of New York State and a thousand other leaders through the world.” (Price Monroe E. 1999).

Improved communication and information access is directly related to social and economic development. However it is observed that the rural population still have difficulty in accessing crucial information in forms they can understand in order to make timely decisions. There is a concern that the gap between the information rich and information poor is getting wider. New information and communication technologies are generating possibilities to solve problems of rural poverty, inequality, and giving an opportunity to bridge the gap between information-rich and information-poor and support sustainable development in rural and agricultural communities.

The ongoing IT revolution has opened huge opportunities for providing access to information as well as to interactive distance learning in rural India. Computer aided knowledge dissemination mechanism help to reach the un-reached and foster new voices and new leaders. The pilot projects of “ Warna Wired Villages” in Kolhapur, Sangli district of Maharashtra and “Info Villages” in Pondicherry have successfully demonstrated the acceptability and usage of high-end information and communication connectivity at village level. Any effort in this direction will be highly effective way to empower the rural population with the most needed commodity that is INFORMATION.

“The Internet subscribers base of Videsh Sanchar Nigam Limited (VSNL) increased from 4151 in 1995-96 to 213,048 in 1998-99. In year 1998-99 alone the total subscriber’s base in the country has grown over 185% to 254000 till March 1999, added by opening up of this to private players. INFAC projections indicate that Internet subscribers base would grow at compound annual growth rate (CAGR) of about 110% to reach 1.75 million in 2002-03 (Economic Times, July 1, 1999). China is having 2.1 million users out of 1.2 billion population. Project Venus, being initiated by Microsoft Cooperation in China w.e.f. December 1999 proposes to connect the 3.2 million TV users in China on Internet, to leap frog almost overnight on to info super highway to give access to entertainment,

education and communication technology in Chinese language on an ordinary TV set (Time Magazine, April 19, 1999). According to Mr. Hwang Eui-Hwan, Director, Technology Standards Division, Ministry of Information and Communications, Republic of Korea, the Government of republic of Korea has drawn up an ambitious plan titled “Cyber Korea-2000” to utilize information technology to overcome the down turn in its economy as part of Asian Economic crisis (ESCAP Report 22-28 April, 1999). By year 2001 nearly 41% of US population will be online, compared to only 13% in Europe. The situation in developing countries is far worse. The percentages of Internet hosts in various countries are given in table below:

Table 1: Number and Percentage of Internet Hosts¹ -

Sl. No.	Country	Hosts	% of Total
1.	U.S.A.	8,224,279	51.0
2.	U.K.	579,492	3.6
3.	Germany	548,168	3.4
4.	Japan	496,427	3.0
5.	Australia	397,460	2.5
6.	Finland	277,207	1.7
7.	Netherlands	214,704	1.3
8.	France	189,786	1.0
9.	Sweden	186,312	1.0

India has less than 1 million hosts in the country; these are also primarily in higher educational institutions and national and multinational corporate sectors. Considering the importance being given by other developed and developing countries on increasing information access to common people there is a strong case for government intervention to upgrade information highway capacity in the country. The constitution of Information Technology (IT) Task Force by Government of India and subsequent acceptance of its main recommendations is a

very positive step in this direction. The three objectives towards which the IT task force has really focussed are: to create a world class information structure, create a policy ambience to enable Indian IT industry to target a \$50 billion annual export of software and to increase the penetration of PCs in India from the current level of 1 for 500 to 1 for 50. This is not really impossible. Given the political will, which is very positive at present and the high percentage of IT literate people in the country, this task can be achieved within the stipulated time frame of 8-10 years i.e. by the year 2008. Agriculture has got a little less emphasis in the task force recommendations. There is only one recommendation out of 108, which focuses on agriculture. This is recommendation no. 79. The same is reproduced below:

According to the IT Task Force recommendations “ The Government shall take all necessary steps to boost IT for agriculture and integrated rural development. Towards this end, a number of demonstration projects will be devised in each state taking into account the specific strengths and needs at local level. A unique “wired village” pilot project has been launched under the aegis of National Information Technology Task Force at the Warna Nagar Cooperative Complex in Kolhapur District in Maharashtra. Efforts will be made to quickly replicate such projects in other states”.

Needs of agriculture are much more than one gets out of this proposal of so called project. To sustain self-sufficiency in food, it is essential that the farming society becomes the most wired society. One should be able to really project that by year 2008 any farmer in a remote village can on demand get the following information by accessing hierarchy of information basis:

1. cropping strategy for farmer fields based on integrated information on soil, weather, fertilizer and pest management models;
2. how and where to get proper seeds on nursery plants;
3. Prevailing prices of various farm equipment and products and series of such set of information, which can lead to most efficient yield and optimum cost benefit to the farmer.

One would like in an ideal situation the following to happen:

1. an agriculture information centre in each village;
2. interactive exchange of information for planning and day to day operations by farmer ;
3. Availability of all the extension services on demand.

Harnessing IT for Agriculture and Rural Development: Indian Scenario:

There are cases of application of information and communication technologies that have made a difference in the delivery of services in rural India. Some of these include the Warna Wired village Project in Maharashtra; Milk collection in dairy co-operatives (National dairy Development Board); Information Villages Project (MS Swaminathan Research Foundation-International Development Research Centre); Information Technology application for Indian Rural Postal System (CMC Limited, Hyderabad); Knowledge Network for grassroots innovations (IIM, Ahmedabad); Application of Satellite Communication for Training Field Workers and Extension Workers in Rural Areas(ISRO); Computerization of Mandal Revenue Offices (MROs) and computer aided administration of revenue department in Andhra Pradesh (Government of Andhra Pradesh.)

- In the **Warna Wired Village Project** covering 70 villages in Maharashtra the existing cooperative structure has been used with state of the art infrastructure to provide Internet access to cooperative societies. The aim is to provide information to villagers by establishing networked booths in the villages.
- The **Information Villages Project** of the MS Swaminathan Research Foundation is aimed at bringing the benefits of modern information and communication technologies to rural families in Pondicherry. A Value Addition Centre, which is the hub of the information network, has been established in Villianur village and four information shops have been established in different villages.
- **National Dairy Development Board.** IT-based machines are being used at milk collection centres, and in cooperatives to measure butter/ fat content of milk, test the quality of milk, and promptly make payment to the farmers. It has resulted in the removal of incentives to cut the milk by adding water, reduced time for payments from 10 days to less than five minutes, and instilled confidence in farmers in the cooperative set up. All of these factors have helped the milk market to expand.
- A CMC pilot project has installed a **Computerized Universal Postal System and a Centralized Accounting and Reporting System** in three post offices in Andhra Pradesh. The technology is designed for rural environments. The systems handle multifunction within a postal office, reduce errors and waiting time, and provide transparent transactions.

- One way video, two way audio teleconferencing interactive networks have been used for education and training by **Indian Space Research Organization**. The major application of the network in rural development was for training extension staff from various departments of the state governments. In addition, a large number of women, Panchayati Raj elected officials, primary school teachers, and child development workers spread over large distances have been trained.
- The **AP State Wide Area Network (APSWAN)**, aims to link the state government's Secretariat with 23 District Headquarters, serving as the backbone for "multimedia-services" (voice, video, and data) that would be used for improved co-ordination between state headquarters and district offices in managing various regulatory, developmental, and hazard mitigation programs of the state government. Mandals will be served by this two-way communication, and electronic commerce applications will be developed. The **AP Value Added Network Services project** hopes to deliver a variety of public services through a large network of information kiosks.
- The **Computer-aided Administration of Registration Department (CARD)**, a project of A.P. aims to introduce a transparent system of property valuation, which is easily accessible to citizens.

The Context of Agricultural Extension in India:

In independent India the Agriculture and rural development was taken on priority basis for systematic development. Community Development Scheme was initiated in 1952. The Agricultural Extension system started in 1953 with National Extension Service (NES), encompassing the whole country into the realm of activities in agriculture, animal husbandry and rural welfare. A three tier administrative structure at district, block and village level took shape in all the states in which administrative control rested at district and technical expertise at the block level. A field level force of village level workers (VLWs) was put into service under subject matter specialists (SMSs) in each block. The responsibility of coordination rested with Block Development Officer (BDO). Since the inception of NES, both extensive and intensive approaches were followed but due to scarce resources dispersed over large areas in the initial stage, much progress could not be made in raising production. Hence, the Intensive Agricultural District Programme (IADP) and Intensive Agricultural Area Programme (IAAP) were introduced in 1960 and 1966 respectively. In order to give added attention Research based Extension Methodology National Demonstration Programmes were launched in 1965 and Lab to Land Programmes (LLPs) were

introduced by Indian Council of Agricultural Research (ICAR) in 1979. The Training and Visit (T&V) system, introduced in 1977 on pilot basis, but later extended to 26 states of the country by 1985, was the first major programme which focussed on Agricultural Extension and defined the role of Village Extension Worker (VEW) to concentrate only on extension only.

The trend thus, till 1980s, had been to focus the Extension system on Agriculture and more specifically to important crops of the concerned area. During the past 2 decades, the work of the extension services has often become more diversified, the demand on the extension functionaries are growing as the Agriculture is becoming more specialized, commercial and on the other hand integration of other enterprises like livestock, horticulture, sericulture in the farming systems. Agricultural Extension in the current context has become recognized as an essential mechanism for delivering information and advice as an input into modern farming (Gwyn E. Jones 1997). The extension is now becoming more diversified, more technology intensive and more demand driven. This requires the Extension Worker at the cutting edge level to be master of so many trades, which is well nigh impossible. The use of Information Technology can help the extension workers to be more effective in meeting farmers information needs.

Limitations of Traditional Extension Methods:

Before one can appreciate the question of what really makes cyber extension necessary it may be helpful to take look at some of the limitations of traditional extension techniques and processes:

1. **Traditional Extension is expensive:** it costs a lot of money to produce and print extension messages / brochures. It is also expensive to train a whole chain of extension personnel (right from district level, sub divisional level, at block level to village level extension worker) to understand the new technology and to answer the possible queries from farmers.
2. **Traditional Extension is very time consuming process:** for a message to pass from university / zonal research station (ZRS) / Krishi Vigyan Kendra (KVK) to farmer, it takes many actors to understand the same and deliver it to next layer. This process takes a lot of time and effort on part of extension machinery of the state.
3. **In Traditional Extension the quality of messages gets eroded as it passes through different layers:** a number of evaluation studies

of Training and Visit (T&V) system indicate that the quality of extension messages gets heavily eroded when it reaches the farmers.

4. Poor Communication Capacity of existing extension systems: Most technical staff within the line departments lack the capacity to effectively communicate with both, the research system and the stakeholders group. Firstly, the flow of the information from research to extension tends to be top-down, rather than a two-way, interactive process aimed at identifying and solving serious problems. Secondly there is little use of up-to-date communications technology, including the use of electronic communication to improve feedback and technical support between research and extension personnel, and to facilitate administrative communication.

It is thus found that the capacity of traditional extension system is very limited, and the challenge in terms of reaching all the villages and all the farmers is becoming more and more difficult to meet. It is observed that the farmers are more dependent on other than public extension system for getting technical advice as well as farming inputs. A visual presentation of the strength of linkages among various extension agencies to the farmer is given at figure –1 on the next page. It is noted that the linkage between farmers and Block Development Officer / Agriculture Officer is poor as compared with the linkage between farmers and traders- market / seed suppliers and Farmers and Television / Radio.

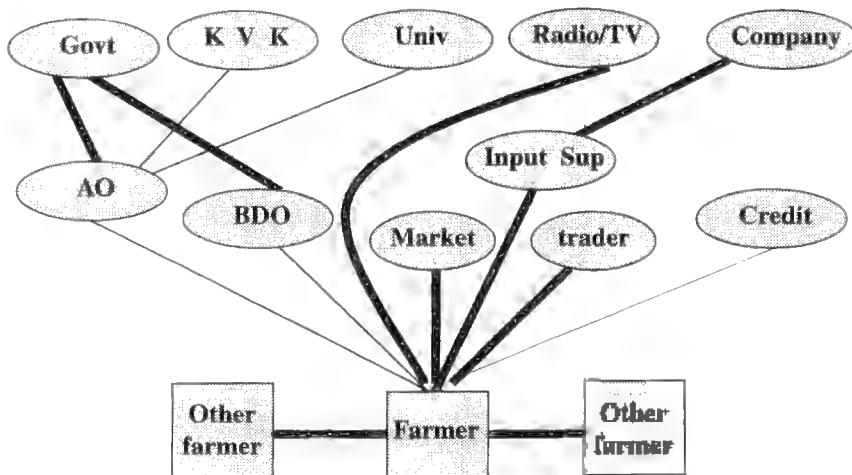


Figure-1: Information Linkages between Farmer and other Agencies.

What is Cyber Extension?

Cyber Space is the imaginary or Virtual space of computers connected with each other on Networks, across the globe. These computers can access information in form of Text, Graphics, audio, video and animation files. Software tools on networks provide facilities to interactively access the information from connected servers. The cyber space thus can be defined as the imaginary space behind the interconnected telecommunications and computer networks, the virtual world.

Agricultural Extension, according to Dr. D. Benor, “ relates to the process of carrying the technology of scientific agriculture to the farmer in order to enable him to utilize the knowledge and a better economy. Agriculture extension service seeks to impart the necessary skills to the farmers for undertaking improved agricultural operations, to make available to them timely information improved practices in an easily understandable form suited to their level of literacy and awareness, and to create in them a favorable attitude for innovation and change” (Benor et. al 1984). Thus Extension is central mechanism in the agricultural development process, both in terms of technology transfer and human resources development (Samanta, 1993).

Cyber Extension *thus can be defined as the Extension over Cyber Space.* Cyber Extension means “using the power of online networks, computer communications and digital interactive multimedia to facilitate dissemination of agricultural technology”. Cyber Extension include effective use of Information and Communication technology, national and international information Networks, Internet, Expert Systems, Multimedia Learning Systems and Computer based training systems to improve information access to the Farmers, Extension Workers, Research Scientists and Extension Managers. According to Mishra 1999, Cyber Extension may be defined as extension over the cyberspace, the imaginary space behind the interconnected telecommunication and computer-networks, the virtual world.

Extension has a communication dimension (Misra 1990). Certain unique features of communication in cyber space should therefore be noted: (I) access to the astounding store-house of information is free, (ii) the information is available instantaneously round the year and twenty four hours a day, (iii) communication can also be interactive (through e-mail, discussion groups, newsgroups), (iv) the information is available from any point on the globe (subject to availability of accessible technology like computer, modem, telephone line etc.), and (v) the

communication is dynamic and ever growing.

Important Tools of Cyber Extension:

The important tools of cyber extension include:

1. E-mail
2. Telnet
3. FTP
4. Gopher, Archie, Veronica
5. Usenet Newsgroups
6. World Wide Web

1. E-Mail:

E-mail (electronic mail) is the most frequently used application in the cyber extension. Currently is being used by over 50 million people for business and personal use. E-mail allows us to send and receive text messages to other users of the Internet. For many people e-mail is the only Internet application used. E-mail can be send /read using a number of tools. Some are fee programmes, some are free and some are shareware. Some of the well known e-mail tools are: Web Browsers like Netscape, Internet Explorer etc., Lotus Notes, Eudora etc. e-mail addresses are of the syntax: mailbox@domain, e.g. vpsharma@hd2.vsnl.net.in, manage74@hotmail.com, dgmanage@hd1.vsnl.net.in etc. To send an e-mail you have to naturally know the receiver's e-mail address. The easiest way to find someone's e-mail address is to ask him/ her. There are some e-mail locating sites available on the Web, but <http://www.four11.com> is widely recognized as one of the best. Four-11 uses three techniques to 'discover' addresses:

- First, interested individuals can complete a form at the four-11 site to have themselves registered;
- Second, Usenet newsgroups posts are scanned to match names with e-mail addresses;
- Third , some Internet Service Providers (ISPs) automatically send registration information to Four-11 when they sign up new members;

If you do not want your address listed with Four-11, you may ask that your entry be deleted.

2. Telnet:

Telnet is an application that allows you to log on to a remote computer. It is like a terminal emulation programme. Telnet sessions present text based data as a terminal would. However now GUI (Graphic User Interface) clients are now available which offer better service. Before the advent of World Wide Web (WWW) the telnet sessions were very common, but now most of the organizations use web sites for applications such as this.

3. FTP (File Transfer Protocol):

FTP use to send copies of files from one computer to another and is responsible for highest percentage of data transferred on Internet. FTP transfers can either through “anonymous” connection or by password protected ID. Command line and graphic user interfaces are also available.

4. Gopher, Archie, Veronica:

Gopher was the first attempt of making it easy to access resources on the Internet. As recently as in 1994, Gopher was considered the most useful Internet tool. Gopher uses text based nested menus to access FTP sites, directories, files and documents. Gopher was designed by computer scientists at the University of Minnesota. Gopher sites did a good job of organizing FTP sites, but it did not take long before the number of Gopher sites was unmanageable. Archie, Veronica, Jughead, and other sites were all developed to assist with finding the right Gopher site. Gopher and its derivatives have been largely made obsolete by the search engines available on the web today. Web clients can handle Gopher transactions, and in fact a user is offered link to a Gopher site without realizing it.

5. Usenet Newsgroups:

More than 20,000 Usenet Newsgroup categories are currently organized which cover almost any imaginable area of interest. Newsgroups provide a bulletin board type area where users can read other opinions and are sent entries of their own to be posted. Modern web browsers like Netscape and Explorer include software for reading and posting to Usenet. Email mailing lists are an alternative for Usenet groups as these lists are normally more focussed.

6. World Wide Web (WWW):

The World Wide Web has become so popular that it has almost replaced

all the above Internet tools and is slowly becoming synonymous Internet. The web is the most popular place to be on the Internet. This is what has brought the masses to the Internet. What is World Wide Web (WWW)? WWW is an organization of hypertext documents containing text, images, animation, sound, video and increasingly interactive programmes. WWW is an easy to use interface and hundreds of thousand sites prepared by school children too multimillion-dollar companies are there on the web. Almost all the universities across the globe are having their presence at WWW. The web is truly worldwide. As simple mouse click can easily transport you from a server in India to one in North America or to one in Europe or Australia, and even Antarctica. The web is more than static text documents. An endless variety of images, sounds, videos and multimedia applications are used to present information. The World Wide Web is called what is because sites around the world can be accessed, and because documents seem to stretch web like through endless hyper links.

The WWW is thus the most important tool of cyber extension. The web sites hosting a particular institution or organizations are searched and browsed through search engines and several of them are available. Some 320 million web pages are currently are online. Search engines are required to wade through this vast mass of information and cull out the required information. The best way to access a web site, however is to know its address technically known as uniform resource locator (URL). Once a URL is known the web site can be accessed directly. Some of the important URLs on agricultural extension are, <http://www.cornell.edu>, <http://www.msu.edu>, <http://www.ag.arizona.edu/aeb/aiaee/journal.html>, <http://www-esd.worldbank.org/extension>. Browsing through search engines of Microsoft Network (MSN) - 60,366 web pages were found on subject of **agricultural extension**. On another search engine infoseek at <http://www.infoseek.com>, 5,457,653 web pages were found on the same subject (as on 8th July 1999, 11 AM). Most of the web pages are common on the search engines, and majority of them belongs to universities in United States. As reported earlier in this paper, over 50% of world's Internet sites are in US and hence the technical material also is mostly available from US sites. The Indian presence on web is very meager, however it is increasing at a good pace. Most of the ICAR institutions are in process of developing web sites and it is expected that by 1999-2000 all the ICAR national institutes, National Research Centres (NRCs), Project Directorates (PDs), State Agricultural Universities (SAUs) and Directorate of Extension (DOE) will have their own web sites. National Institute of Agricultural Extension Management (MANAGE) and National Institute of Rural

Development (NIRD) have already hosted their web site with URL <http://www.manageagri.com/> and <http://www.nird.com/>. More and more extension information is expected to be on the web in very near future. The packaging and hosting of technical extension material and establishing connectivity at Krishi Vigyan Kendras (KVKs), District Agricultural Officers (DAOs), District Rural Development Agency (DRDAs) and other participating agencies has to be taken up side by side. Only then we can harness the true potential of cyber extension.

The methods for cyber extension:

The World Wide Web can help the extension world wide in the following ways:

- (i) Providing interaction among research scientists, extension workers, farmers and other rural people through e-mail;
- (ii) Providing up-to-date news and information services, such as market prices and weather conditions;
- (iii) A question and answer service among Scientists, Extension Functionaries and Farmers, where experts respond to queries on specialized subjects;
- (iv) Creation and maintenance of Statistical Databases on critical agricultural and rural development parameters that can be queried on demand;
- (v) Providing the details of Poverty Alleviation Schemes on the Internet;
- (vi) Providing status of various Government Programmes and details about their implementation mechanism on demand basis;
- (vii) Hosting web sites by major institutions participating in agricultural extension, putting latest packages of practices (with more situation specific packages), for various agro-eco regions. These institutions, particularly the Project Directorates may also place the diagnostic and pre-emptive farm practices for the major crops particularly the commercial crops, well in advance of the concerned crop season. This can help the extension workers to access latest information on IPM (Integrated Pest Management), INM (Integrated Nutrients Management) and other such practices for high value important commercial crops. The institutions will also be able to get direct customer feedback for their packages.
- (viii) Launching online rural development and extension journals, newsletters etc. (with or without print version);

- (ix) Providing Internet access at district and block level agriculture and rural development offices. This service may also be open for rural communities on fixed days. This connectivity can also be used to download online publications on useful topics from anywhere in the world;
- (x) Opening of cyber cafes to enable educated rural people and extension workers at village level to have direct access to world wide web for having market information etc.;
- (xi) Providing maps that display different features, such as population density, crops planted, etc.;
- (xii) Providing video clips to demonstrate complex procedures; and audio files for re-broadcast on local radio stations (FAO, 1999);
- (xiii) Providing mechanism of user / beneficiary feed back for the Public Sector Schemes.

The cyber extension thus can be used as a complement in conjunction with existing extension and rural development mechanism. The cyber extension naturally, cannot and will not eliminate all the problems of the existing programmes and schemes. And in most cases, cyber extension will not even replace the traditional extension. Instead, it will both add to and subtract from today's extension methodology. 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, 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 which 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 need for agricultural and rural information and advisory services is likely to intensify in the foreseeable future. The experiences of “ Info Village Project” in Pondicherry by M.S. Swaminathan Research Foundation and “Warna Wired Villages” in Maharashtra in India have conclusively demonstrated that if the information is available at the door step farmers are willing to pay and make use of extension information, marketing information. It has been demonstrated by these initiatives that the villagers can manage these information centres themselves. At one of the villages (Embalam), under “ Info Village Project” in Pondicherry four village-women, who have studied up to only class IX are managing the Information Centre effectively. They are able to send and receive e-mail, Fax to/from the main hub at Villianur and also to MSSRF headquarters at Chennai. They download the daily news from the main hub and display at their Bulletin Board, put outside their info centre. The establishment of Farmers Information and Advisory Centre (FIACs) at the block level in the 6 pilot districts under the National Agricultural Technology Project (NATP) is an indication of the shape of the things to come in the future.

Lessons Learnt from the Success Stories of “ Warna Wired Villages” and “ Info Villages Project”:

Some key features, which were found to be common in the two projects, are those, both the projects are highly user friendly, demand driven and local people managed. Hence it is suggested that while designing an IT based programme for rural communities care must be taken to ensure that the programme is:

- People managed
 - Demand driven
 - Caters to all community members including women and youth
- Content should have local relevance
- Content should reflect Value addition
 - Content should be in the local language
 - Facilitating rather than encyclopedic
 - information that makes a difference is one that is useful in directing local activities

Potential Advantages of Cyber Extension:

1. **Cyber Extension will save money, time and effort:** scientists will prepare electronic version of messages themselves. These versions don't have to be printed and posted. This will save money and time. Cyber messages will be updated online and that saves time too. Cyber extension can provide more in-depth analysis and can also provide detailed on-farm research results to the curious users / farmers.
2. **Cyber Extension will save time, cut steps from extension process:** Cyber Extension will remove a number of steps altogether from the traditional extension process. In the context of Agriculture, the zonal workshops and training to subject matter specialists (SMS) can be eliminated altogether. All the concerned will get the information immediately and queries / clarifications will also be addressed equally fast, without involving a chain of extension machinery.
3. **Cyber Extension will be information rich and interactive:** It appeals to the curious extension workers and analytical farmers. It will allow them to search and locate the information they need quickly. The extension workers can talk to the concerned scientists for more information on the subject, wherever the scientists may be. The rural technologies can be made available on CD-ROMs for quicker dissemination.
4. **Cyber Extension will offer instant international reach:** Online networks have created an instant global village. Cyber extension will eliminate the time and distance barrier that get in the way of knowing the latest information on any particular problem from any part of the world.
5. **Cyber Extension will be continuously available:** One of the key attributes of an online information service is that it is available all the time, 24 hours a day, 365 days a year. Your cyber extension functionary doesn't sleep; he doesn't go on leave. If you have connectivity, you can get information, from wherever it is available.

Now it is the job of scientists particularly the extension professionals to collate, edit and package the technical information and put it on the net. The national, regional and state level institutes like NIRD /MANAGE / State Institutes of Rural Development (SIRDs) /State Agricultural Management and Extension Training Institutes (SAMETIs) / KVKs / ZRS / SAUs have a very important role to play in taking lead to package the information on Agricultural Extension and Rural Development Policies, schemes, programmes and working mechanism at the grass-

root level and host the same on their WEB sites. We need to facilitate the task of taking the information access to the village level. There is already a concern that the gap between the information rich and information poor is getting wider. Hence it is incumbent on all of us, the administrators, Non Government Organisations (working for Rural Sector), trainers and scientists, all who are involved in the task of facilitating the upliftment of the rural communities to provide information access to the last person in the rural areas: Reaching the un-reached.

References:

- Benor et al. (1984). Training and Visit Extension, A World Bank Publication 1984. P-138
- FAO (1993). The Potentials of Microcomputers in support of Agricultural extension, education and training. Rome: FAO.
- FAO (1999). Virtual Extension Research Communication, on <http://www.fao.org/WAICENT/vercon/> as on July 8'1999. Rome: FAO.
- Gwyn E. Jones (1997) The History, Development, and Future of Agricultural Extension in Improving Agricultural Extension – A Reference Manual Edited by Burton E. Swanson et al. FAO Rome 1997
- ICAR (1998) - Information Systems Development: Development strategies and implementation plans under NATP ICAR 1998.
- Javed Jabbar (1999). *The observations in first plenary session of Asia Information Poor to Information Rich : Strategies for 21st century*, Chennai on July 1, 1999 by Mr. Javed Jabbar, founder Chairman, South Asia Media Association and former Minister / Senator of Pakistan.
- Leeuwis, C. (1993). *Of Computers, myths and modeling: The social construction of diversity, knowledge, information and communication technologies in Dutch horticulture and agricultural extension*. Wageningen Studies in Sociology, 36. Wageningen: Agricultural University.
- Maunder, A.H. (1973). Agricultural Extension: A Reference Manual (Abridged edition). Rome: FAO.
- Price Monroe E. (1999). *Research for Strategies for 21st Century*, Dr. Price Monroe E, Director, Centre for Socio-legal studies, Wolfson College, University of Oxford, UK, paper presented at AMIC, 8th Conference July 1-3, 1999.

- Samanta R.K. (1993). *Extension Strategy for Agricultural Development in 21st Century*. Mittal Publications Delhi.
- Zipp, W. (1994). *Improving the Transfer and use of agricultural information: A guide to Information Technology*. World Bank Discussion Paper 247. Washington DC: The World Bank.