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Cyber Extension for Rural Development

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***Abstract* — The educational background of a young generation of farmers is significant as they need to have higher ability to access more complicated extension service methods. In regard to new extension challenges, the development and utilization of information and communication technologies (ICTs) for agricultural extension has become a promising future strategy. ICTs in some cases could guarantee high speed and effectiveness of information distribution for new technologies and innovations. In practice, cyber extension is the utilization of online networking, computer and digital interactive multimedia to facilitate the dissemination of agricultural technology.**

***Keywords* — Cyber Extension, Agricultural Development, Agricultural Markets, Information and Communication Technologies, E-Marketing.**

I. INTRODUCTION

Recent global issues: (i) liberalization, (ii) privatization (iii) democratization and (iv) decentralization determine the policy process for agricultural and rural development. The consequence of the phenomenon changes the paradigm in agricultural development. Agricultural and rural extension played an important role in shaping the success of agricultural development. According to Jones (1997), agricultural extension is an essential mechanism for delivery of knowledge and advice as an input for modern farming. Information and communication technologies (ICTs) are a range of electronic technologies which when converged in new configurations are flexible, adaptable, enabling and capable of transforming organizations and redefining social relations". The range of technologies is increasing all the time and „ there is a convergence between the new technologies and conventional media" (Michiels and Van Crowder, 2001). The need is of a shift of focus from delivery of technology to delivery of knowledge and information. The pivotal roles of agricultural extension encompass the communication and transfer of new knowledge and innovation; technical and non-technical advisories; and the facilitation of clients (producers, input agents, farmer groups, farmer associations, consumer groups). From the perspective of the agricultural extension system, optimizing of accumulation and distribution of agricultural knowledge and innovation has been acknowledged as triangle knowledge model including research, education and extension; with farmers situated in the center of the system as the best solution for overcoming problem. As noted by Sharma (2006), the use of ICTs for agricultural and rural extension was regarded as '□Cyber Extension'.

New hope in agriculture and rural development"

Cyber extension is regarded as the use of ICTs for agri-cultural and rural extension. There are three systems developed of cyber extension which are:

(i) Online consultation system -web consultation.
(ii) Hand phone -based internet system.
(iii) Android technology -based smart telephone.

The utilization of agricultural and rural cyber extension is very useful for rural farmers to increase crop yields, as well as to consult researchers about agricultural issues. In some countries, it serves to escalate society's learning. By utilizing online networking, computer and digital interactive multimedia, not only researchers and farmers, but also by the whole society can benefit from it. Cyber extension is regarded as a strategic model since the model could improve information accessibility for farmers, field extension officers, extension managers, researchers, input agents and other related parties on extension practices. The utilization of cyber agricultural and rural extension is not only performed by developed countries but also by developing ones. Several Asian countries have quickly developed cyber extension for farming. The development of cyber extension could facilitate many parties on a real time basis. Databases are a fundamental prerequisite for the development of cyber extension. Thus, information could be accessed through email, short message and interactive discussion. Compared to conventional extension methods, many parties believe cyber extension has advantages '□" higher speed of data collection, identification of the most recent farming conditions, communication for information '□" meaning, the system could distribute information to huge number of users at the same time. Cyber means, relating to "Information Technology, the Internet, virtual reality and the Cyber Space" (Sharma 2003). Cyber Space the cyber space can be defined as the imaginary space behind the inter-connected telecommunications and computer networks, the virtual world. Software tools on networks provide facilities to interactively access the information from connected servers (Wijekoon, 2003). Cyber Extension Cyber Extension thus can be defined as the "Extension over Cyber Space".

Identifying Stakeholders: Action parties

There are various stakeholders in the ICT projects-

The Governments at the Centre and in States,

The civil society organizations and the corporate sector.

The projects sponsored and funded by the government are essentially based on e-governance model. Whereas the projects initiated by society groups and the corporate sector fall under the categories of social work or philanthropy or Corporate Social Responsibility. There are numerous successful projects that have been implemented in India and many of them are on the road to success (Vivek Ahuja et al.2011).

Cyber extension a revolutionary

Written are READ

(E.g: Newspapers, circular letters, leaflets, hand-outs and bulletins).

Spoken are HEARD

(E.g: Farm and home visits, office calls, Agricultural clinics, and radio and discussion meetings).

Visuals are SEEN

(E.g: posters, charts, exhibitions, maps and pictures).

Audio visuals are READ, HEARD & SEEN

(E.g: emails, video conferencing, CD's, and video demonstrations; cyber extension).

Due to their multi interaction between audios and visuals cyber extension methods are way ahead in efficiency than other ordinary extension methods. But there are advantages and drawbacks of cyber extension systems.

Following are the advantages of cyber extension:

i. It's the most revolutionary method of agricultural extension teaching methods.
ii. Due to its convenience, the latest technologies invented in the other end of the world will reach in a minute to the local farmers.
iii. Rural communities do not feel "we are isolated", instead of that they feel "we are connected to the world".
iv. Farmers become computer-literate.
v. The Internet will become a rich source of education not only for the farmer, also for his/her family.
vi. Farmers will feel good about their personality when using cyber extension; they feel honoured.
vii. Free access to the websites will increase the farmer participation in extension programs.
viii. Farmers will be well educated and aware of agricultural technologies by seeing, hearing and watching the demonstrations.
ix. Farmers will be well informed of latest issues related to agriculture around the world.
x. Due to cyber extension systems up to date data, farmers are able to forecast the weather, their harvest and even market trends.
xi. Reading newsletters on the websites, farmers do not face the drastic situations such as price fix, price fluctuations, intermediaries smuggling, black market prices etc.
xii. Unlike traditional farming, farmers can seek new ventures for their excess production (starting jam, cordial production, investing in mushroom cultivation, compost production, milk and meat processing etc.).
xiii. Due to technological advancements, the young generation tend to involve in agricultural activities.
xiv. Extension officers can deal with extension programs without worrying about the other office work, time and transportation costs etc.
xv. Extension officers can pre-record their demonstrations and deliver it later to the farmer community.
xvi. Unlike the traditional lazy extension officials, use of cyber extension will make them actively partici-
-pated in the extension programs.
xvii. The dynamic nature of extension programs will be increased.
xviii. The extension officers will have to work less effortlessly (as farmers know new methods due to cyber extension) due to pre-awareness of the farmers.
xix. Extension officers can follow up the work; create progress reports done by farmers online without reaching them.
xx. Extension officers can change extension programmes according to its compatibility (***situational*** – new varieties of paddy to be cultivated in a different agro-ecological zone, ***cultural*** - website of Agricultural Department of Sri Lanka is trilingual).
xxi. Problems and risks related to trialabilty is reduced to a major extend.
xxii. Observability of agricultural aspects not only in local, also in international level is open to general public.
xxiii. Extension programs will be no longer extensive; it will be close and easy as just as a click of a mouse!

Following are the drawbacks of cyber extension

i. As cyber extension facilities are not available in every village, farmers may have to travel far for it.
ii. Due to rapid changes occur in technology, farmers will be left with a doubt and they will find it difficult overcome the situation of "information overload".
iii. Most of the rural farmers are still illiterate. For such people it will be harder to become computer literate.
iv. As still a developing country, seeing the latest agricultural advances in developed countries (Eg: Canada) will leave the farmers and the general public a feeling of shame (like they have it all, we have nothing), a doubt within themselves.
v. The cyber extension will loosen the bonds of a family (the children will consume their time logged in Face book, etc. rather than helping the farming).
vi. Free access to the internet will degrade the quality of the cyber extensions.
vii. False information, fake facts will be a great threat not only to the agricultural activities but for the general awareness also.(e.g: one website may tell that using heavy metals in minimal amounts in the fertilizers may not be a risk for your health, and in another website you may see the traces of heavy metals is lethal)
viii. As the cyber extension is available in Agrarian Service Centres during the office hours, the farmer will have to give up farming operations during the daytime.
ix. New ventures illustrated in cyber space are not modified into locality. Adaptation of such technology will risk the harvest. Some of the materials used in foreign cyber extension networks, are not available in our country.
x. If there is a malfunction in the cyber extension system, there is a risk of losing all the data kept for years. A back-up plan should always be available.

xi. As there are thousands of information available in cyber extension, extension officers may include false data in their reports (Like copying and pasting from another website, unaware of what to bed one).
xii. Most of the cyber extension systems do not issue their data free. They require endless registrations, sign-ups, passwords, private details etc.
xiii. Most of the cyber extension systems aren't situational and cultural compatible.
xiv. Information provided is not in local languages.
xv. Dissemination of technology through cyber extension in highly remote areas, extreme corners of the country is a difficult, unattainable task.
xvi. Observability of data is banned in certain regions of the world (like saying "these information is not available for your region, its available only to citizens of US, EU etc.)

Case Study on cyber extension

Dhar is a tribal dominated and a drought prone district of Madhya Pradesh. More than half of the population of the district is tribal and around two-fifth are living below poverty line. Gyandoot is a low cost rural intranet project based on e-governance started in the year 2000. The main aim of Gyandoot is to harness Information and Communication Technologies to improve governance at village, block and district levels. The project has linked around 35 kiosks in the district with the district headquarters of the local government. The kiosks include a networked computer and printer. This set up has been enabled by the State government. Software working in Hindi language and touch screen applications has been designed to encourage maximum utilization and access by poor rural farmers. The project has a broader target of overall development of the rural setup rather than just focusing on agricultural extension. Gyandoot provides many information services to the farmers like best practices related to agriculture, prices of agricultural produce in different markets, online registration and provision of land records, rural email facility, information regarding government (rural development) programs, Ask the Expert, Avedan Patra (application formats for rural development schemes). Gyandoot also has a provision of a database that stores information regarding the best practices for crop cultivation. Additionally, the online portal makes available prevailing prices of prominent crops (wheat, gram, soybean, etc., giving varieties) at local and other auction centers of the country. Other value addition services are the provision of online registration of land and Khasra certificates for the farmers. The facility for auction site gives the farmers a new way of selling their lands, agricultural machinery, bullocks and equipments. Usually, in this kind of buying in selling, middlemen are involved. The online facility eliminates the possibility of the middlemen and their commission and dictated prices. "Ask the expert" facility answers the queries of the farmers regarding agriculture, animal husbandry, health, etc.

The Agriculture Information Management System (AgMIS-www.agmis.net). The DOA has setup the web of www.agridept.gov.lk to serve farmers, students as well as the general public. The website, presents many of the agro-related information, statistics, news, price information) and recent publications. The cyber extension is a vital, and a powerful tool to support the agricultural extension functionaries. Availability of information over internet assists the proper mechanisms of agricultural extension. It makes the service to deliver quickly and more effectively. The enhanced, smooth, up to date reliable information communication among the above components of cyber extension results in the overall development of the agriculture system of the country enabling not only self-sufficiency in agriculture, also a great powerful nation armed with quality cyber extension.

E- Marketing

The consequence of the recent global issues made it necessary for a paradigm change in agricultural development, including agricultural extension practices. Agricultural and rural extension played an important role in shaping the success of agricultural development. E-Marketing (Electronic Marketing) are also known as Internet Marketing, Web Marketing, Digital Marketing, or Online Marketing. E-marketing is the process of marketing a product or service using the Internet. E-markerting not only includes marketing on the Internet, but also includes marketing done via e-mail and wireless media. It uses a range of technologies to help connect businesses to their customers. E-Marketing is a tool of cyber extension.

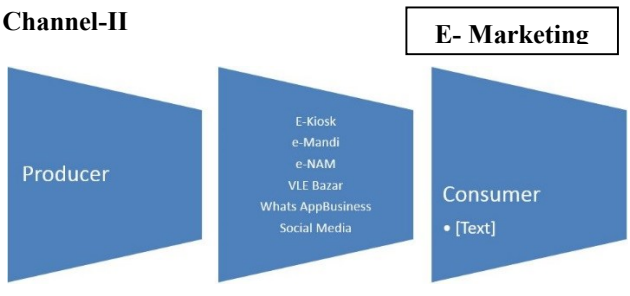
Fig. 1. E-marketing

Marketing Channels

There are two marketing channels observed in the study area through which the produce is passing from producers to the ultimate consumers. These channels are

Channel-I

Channel-II



e-Kiosk A small, self-standing structure such as a newsstand or ticket booth. The original **kiosk** had room inside for a person who handled the transactions; however, the term E- Kiosk evolved to refer to unattended self-service booths with computers that dispense information or make sales via a touchscreen.

e-NAM stands for National Agriculture Market

National Agriculture Market (NAM) is a pan-India electronic trading portal which networks the existing APMC mandis to create a unified national market for agricultural commodities.

The NAM Portal provides a single window service for all APMC related information and services. This includes commodity arrivals & prices, buy & sell trade offers, provision to respond to trade offers, among other services. While material flow (agriculture produce) continue to happen through mandis, an online market reduces transaction costs and information asymmetry.

VLE bazaar is a e-commerce service platform to promote rural market products in India. An initiative of the CSC SPV, it will enable VLEs to sell handmade or local products, also create an opportunity to build their own brand. VLEs can display their products on CSC eCommerce portal to open it for all over India market though the proposed 2.5 Lacs Common Service Centres (CSCs). This eCommerce service will help in facilitation augmentation of economic activities in CSCs and help to enhance revenue generation among CSCs.

CSC SPV is also to tie up with courier partner which enables easy and on time delivery on products.

WhatsApp Business is an Android app which is free to download, and was built with the small business owner in mind. With the app, businesses can interact with customers easily by using tools to automate, sort and quickly respond to messages.

ICT initiatives for agricultural development in India

There are many ICT projects supporting agricultural extension in India. Some of the ICT projects for agriculture:

Table 1. ICT Projects in Various States of India

S. No.	Name of the Project	States where the project is running
	Gyandoot project	Madhya Pradesh
	Warana Wired Village project	Maharashtra
	Information Village project of the M S Swaminathan	Pondicherry
	Research Foundation (MSSRF) Kisan	Andhra Pradesh
	Automated Milk Collection Centres of Amul dairy cooperatives	Gujarat
	Land Record Computerisation (Bhoomi)	Karnataka
	Knowledge Network for Grass Root Innovations – Society for Research and Initiatives (SRISTI)	Gujarat

II. CONCLUSION

The important components of Agricultural extension systems are agricultural research, marketing and farmers. Cyber extension using ICT tools bridges the communication gap between these components. The enhanced and smooth communication among these components of the system results in the overall development of the agriculture system of the country.

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