e-Arik: ICTs for Agricultural Extension Services to the Tribal Farmers

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Abstract

Access to appropriate agricultural information is a difficult task for the rural tribal farmers of North-East India. The number of successful e-Agriculture initiatives in rural India not replicated among the rural tribal farmers. There is no noteworthy village level ICT initiatives in the tribal population dominated eight states of North-East India, where large proportion of population live below the poverty line. Further, low and uncertain agricultural productivity, frequent natural calamities add the problem of the North- East India. The region's geographical remoteness, difficult terrain and inadequate man power in the rural developmental departments make the information access of rural farmers become distant reality and hinder the socio-economic development of the region. Considering grim scenario in the region, a research project entitled "e-Arik" ("Arik" means "Agriculture" in the Adi tribal dialect of Arunachal Pradesh State) has been implemented by the College of Horticulture and Forestry, Central Agricultural University. This two year research project sponsored by the Department of Scientific and Industrial Research (DSIR), Ministry of Science and Technology, Government of India, examines the application of ICTs in providing agricultural extension services and its socio-economic impact among rural tribal farming community in the "Yagrung" and near by villages of East Siang district of Arunachal Pradesh State. The project experiments single window system for the improved agricultural information and technology delivery by using computer, internet, phone, radio and television. Project provides all time expert consultation on agriculture production, protection and marketing aspects through ICTs. The e-Arik research project staff regularly undertakes field visits to observe crop condition, diagnosis the pest, diseases, and nutrient deficiency, physiological problems, and then field crop condition digitally documented. To solve complex crop pest, diseases, nutrient deficiency and physiological problems, digital photographs is transmitted through e-mail from e-Arik-village knowledge centre to the farm scientists of Central Agricultural University and recommendations passed on to the farmers. Further, farm scientists undertake need based field visits and provide expert advice to the farmers. Further, farmers training and demonstrations were conducted by the project staff and or extension personnel from the developmental departments. Project portal (www.earik.in) provides information on crop cultivation, agriculture and rural developmental departments and their schemes, day to day market information and weather conditions, which is also displayed in the village knowledge centre notice board. Further, information on health, education, governance and other information for tribal farmers are available in the project portal. The village agricultural library at the e-Arik-village knowledge centre is having the collection of farm publications, multimedia CDs and daily news papers for the ready reference of the farmers and others. Farm input display unit at e-Arik-village knowledge centre exhibits bio-fertilizers, organic pesticides and fungicide samples for the familiarization among the farmers. The ICT awareness lectures, regular trainings were conducted for the benefit of village children, students, village school teachers and villagers. The village advisory committee regularly reviews the progress of the project.

Innovative approaches such as; farmer to farmer communication, local leadership and self-help approaches were employed for the agricultural technology transfer. The experiences of e-Arik project shows encouraging results for the sustainability and scaling-up of the project in North-East India.

Introduction

The reports indicated that 45 per cent of the world's ICT projects implemented in India. And also Asia's highest number of information kiosks implemented across rural India (Chattopadhyay, 2004; Manzar, 2004). In addition, Government of India policy proposed a knowledge centre in every village by 2007 (Swaminathan, 2005). However, the most of the ICT projects are implemented in the socio- economically developed states of India. There is no village level ICT initiative in the poorest tribal population dominated eight states of North-East India. Considering the geographical remoteness of the region, Ministry of Information Technology, Government of India implemented Community Information Centres in all the head quarters of 487 blocks of 79 districts of North-East India. But, the functioning of the centres not up to the expectation. The basic purpose of community information centeres to provide e-education, e-governance, e-health and e-business opportunity not realized and centres merely act as a internet browsing centres to elite and educated urban population (Saravanan, 2005). The e-readiness assessment report-2004 of Government of India indicated that all the eight states of the North-East India categorized under below average and least achievers category. The report also recommends increasing the awareness of potential benefits of ICTs in rural development (MoIT- GoI, 2004).

The region has exhibited most backwardness in most important indicators of human development such as income and health. The region is also having 40.01% of population below poverty line (MoRD – GoI, 2005). Further, low agricultural productivity, endemic malaria, drug addiction and AIDS add the problem of the North- East India. The non-income poverty in terms of inadequate information on advanced farm technologies, market intelligence and rural development schemes produces the income poverty in the region. The limited technical manpower, lack of transport and communication facilities, limited financial support to the technology transfer and less infrastructure facility creates huge technological gap among rural tribal farming community. Further, difficult terrain, mountainous periphery and frequent natural disasters hinder the development of the region. Due to non-availability of improved technological information to the tribal farmers, agriculture exhibits low unstable productivity, which makes food insecurity problem and also poses serious developmental question to the policy makers. Among North-East States, Arunachal Pradesh state is having lowest agricultural productivity and least performance in almost all human development indicators among the eight states of the region (UNDP, 2001). The region also exhibits vast natural resource potential for the development. The current functional literacy rate and the presence of local institutions like "Tribal Village Council" will facilitate the development process. In this existing scenario, it is expected that application of ICTs in agricultural technologies provision to the tribal farming community of Arunachal State of North –East India will helps to foster the socio economic empowerment of tribal farming community. Considering grim scenario in the region, a research project entitled "e-Arik" ("Arik" means "Agriculture" in the Adi tribal dialect of Arunachal Pradesh State) has been implemented by the College of Horticulture and

Forestry, Central Agricultural University. This two year research project sponsored by the Department of Scientific and Industrial Research (DSIR), Ministry of Science and Technology, Government of India, examines the application of ICTs in providing agricultural extension services and its socio-economic impact among rural tribal farming community in the "Yagrung" and near by villages of East Siang district of Arunachal Pradesh State.

Fig. 1 Map Showing the e-Arik Project Area

Farmers Information Needs Assessment:

As a par of e-Arik project, a research study was conducted to assess the farm information input pattern, information needs and Information & Communication Technologies (ICTs) preference of 60 farmers of Yagrung, Tekang and Kangkong villages of East Siang District, Arunachal Pradesh State was conducted during August and September, 2007.   From the findings, it is

concluded that a overwhelming majority of the tribal farmers are not having access to the advanced agricultural information. Considerable proportions of the farmers have regular radio listening behaviour for getting farm related information. Most of the farmers require information on all farm based activities. Pest and diseases management information for paddy and khasi mandarin crops were demanded by a greater proportion of farmers. Through Participatory Rural Appraisal, farmers analysed their resource availability, constraints and opportunities for farming. Further, they diagrammatically depicted the seasonal variations in crop cultivation, intercultural operations, pest and diseases occurrence, and farm produce harvesting. Further, the PRA exercise indicated that cent percent of farmers possessed radio. Most of the farmers preferred internet, radio, and television for getting agricultural information in the village knowledge centre.

ICT Indicators:

A survey was conducted to find out the availability, access and usage of ICT indicators in the three villages namely; Yagrung, Tekang and Kangkong villages of Pasighat circle of Esat Siang District of Arunachal Pradesh state, during September, 2007. A structured interview schedule was developed based on the International Telecommunication Union (ITU) and United Nations Conference on Trade and Development (UNCTAD) identified ICT indicators on the "Access to", "Usage indicators" (on age, gender education, frequency and purpose) and ICT infrastructure. Information was collected from the individuals and households. Findings indicated that four-fifths of rural population possess radio, and nearly one-third of farmers have TV and fixed phone line. However, very few possess cellular phones, with no one having Computer and internet facility in three villages. More than half of the households (56 per cent) are not connected with electricity. Very few number of students and degree holders are aware and also using the internet, that too, occasionally. Among ICTs, Radio is widely possessed (80 per cent) and used for getting agricultural information.

Project Working Mechanism

After assessing farmers' information needs, the project experiments single window system for the improved agricultural information and technology delivery by using computer, internet, phone, radio and television. Project provides all time expert consultation on agriculture production, protection and marketing aspects through ICTs. The e-Arik research project staff regularly undertakes field visits to observe crop condition, diagnosis the pest, diseases, and nutrient deficiency, physiological problems, and then field crop condition digitally documented. To solve complex crop pest, diseases, nutrient deficiency and physiological problems, digital photographs is transmitted through e-mail from e-Arik-village knowledge centre to the farm scientists of Central Agricultural University and recommendations passed on to the farmers. Further, farm scientists undertake need based field visits and provide expert advice to the farmers. Further, farmers training and demonstrations were conducted by the project staff and or extension personnel from the developmental departments. Project portal (www.earik.in) provides information on crop cultivation, agriculture and rural developmental departments and their schemes, day to day market information and weather conditions, which is also displayed in the village knowledge centre notice board. Further, information on health, education, governance and other information for tribal farmers are available in the project portal. The village agricultural library at the e-Arik-village knowledge centre is having the collection of farm publications, multimedia CDs and daily news papers for the ready reference of the farmers

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Major Activities of the e-Arik Project

Phase I: From May, 2007 to April, 2008

1. Farmers' Information Needs Assessment
2. Survey on ICT Indicators
3. Field Visits and Diagnosis
4. Digital Documentation
5. Farm Advisory Services
6. On-farm Demonstrations
7. Market and Weather Information
8. Awareness Meetings & Group Discussions
9. Organizing Multimedia Shows
10. Identifying & Developing Village Knowledge Managers/ Intermediaries
11. Farm Inputs Familiarization
12. Establishing Village Library
13. Creating Digital Resource
14. Information on Health, Education & Governance
15. Computer Literacy to the Villagers

Fig 2. e-Arik: One Step Single Window System for Agricultural Extension

Phse II: From May, 2008 to April, 2009

1. Five Hundred Registered Farmers
2. Developing Para Extension Professionals in Villages
3. Digital Documentation of Farmers' Field History
4. Regular Field Visits & Advisory Services by Facilitators
5. Digital Documentation of ITKs
6. Facilitating Multi-Agency Extension
7. On-Farm Demonstrations
8. Participatory Video on Farm Technologies
9. Farm Advisory Publications
10. Strengthening Village Library
11. Creating Farmer Specific-Digital Database
12. Information on Health, Education & Governance

13. Computer Literacy to the Villagers
14. Project Impact Assessment
15. Organisng Workshop

Fig 3. Farm Information Dissemination in e-Arik Project

Conclusion

Initial experiences of e-Arik project shows encouraging results for farm technology dissemination, creating e-Awareness and e-literacy among rural tribal people. Farmers are very much enthusiastic to participate in the e-Arik project activities. Agriculture information and technology dissemination through ICTs combined with inter personal channels resulted highest adoption level among tribal farmers. However, collaboration efforts to integrate other agricultural and rural developmental departments are not up to the satisfaction level. Because, e-awareness e-readiness, ICT availability and usage level is lowest among rural developmental officials. Further, inadequate ICT infrastructure, particularly frequent power cuts makes difficult to sustain momentum in the ICT project. Interestingly, 68 per cent of tribal farmers are willing pay for the extension services of e-Arik project and cent percent of respondents expressed desire for continuation of the e-Arik project with farm input supply business model. The ICTs combined with traditional extension methods proves synergetic combination in the least developed tribal areas of North-East India.

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