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e-Village for Agriculture and Rural Development: Integrating ICTs with Traditional Agricultural Extension Methods in North-East India

R. Saravanan, C. Kathiresan, Narmi Darang, T. Indra Devi, Supriya Devi and Lizamoni Chungkurang

ABSTRACT

India's North-East is predominantly hill agriculture based and endowed with rich natural resources for the development. The average rainfall in the region is the highest in the country. However, low agricultural productivity and food in-security are largely prevalent in the North- East India. Lack of adequate information on advanced farm technologies, market intelligence and rural development schemes led to the income poverty in the region. The limited technical manpower, lack of transport and communication facilities, inadequate financial support to the technology transfer and less infrastructure facility creates huge technological gap among rural tribal farming community. Considering the disappointing agricultural and rural development scenario and realising the potential of ICTs, the Central Agricultural University (CAU), College of Horticulture and Forestry, Pasighat, Arunachal Pradesh and Centre for Development of Advanced Computing (C-DAC), Hyderabad have initiated a pilot project named "Model e-Villages in North-East India", an innovative e-Governance initiative committed to the agricultural and rural development. The Model e-Village project implemented in the selected ten remote tribal villages of East Siang District of Arunachal Pradesh State and provides regular e-awareness and e-literacy programmes and also experimenting local need

based IT applications in the area of agriculture and allied sectors. The e-Village project activities includes; Village Awareness Meetings and Identification of e-Villages, Villagers' Information Needs Assessment, ICT Capacity Building Workshop for Facilitators, facilitating Online and Offline Access to the Agricultural Resources by the tribal farmers, Convergence of University Education, Research and Extension Programmes with e-Village Centre, Advanced Farm Technology Demonstrations by the e-Village Project Fellows, KVK Extension Activities at the e-Village Centres, Village Adoption Scheme of the Central Agricultural University, Rural Horticultural Work Experience Programme (RHWE), Environmental Awareness Programmes, Computer Education and e-Literacy, Multimedia CDs, National Seminar & Exposure Visits and TV-DTH: Awareness, Education & Entertainment. Field experiences shows that farmers are very keen to get agricultural related information from the e-Village centre. However, they feel that along with e-Resources, field level demonstrations are must to understand advanced farm technologies. Even though, they value the importance of agriculture information for livelihood generation, they are unwilling to pay even a nominal fee. Because, the feel that providing agricultural information is a public good and welfare activity of government institutions. But, interestingly, nine out of ten e-Village centres are hosted at the infrastructure (house & furniture, electricity connection) provided by the community at free of cost. Even, some of the e-Village centres farmers are willing to share expenditure on consumables (printer cartridge, paper *etc.*). Computer training to the village children are very much appreciated by the villagers. The community members voluntarily participated in large numbers in all the e-Village programmes. Considering, inadequate local need based content, language problem, inadequate ICT infrastructure (telephone, internet), road and other communication facilities in Arunachal Pradesh, integrating conventional extension approaches with ICTs (e-Village centres) emerged as a appropriate mechanism for agriculture and rural development in remote and backward rural areas.

Introduction

India's North-East is endowed with rich natural resources for the development. The average rainfall in the region is the highest in the country. However, the region has exhibited most backwardness in most important indicators of human development. 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 creates food insecurity

problem and also poses serious developmental question to the policy makers. Among eight north-east states, Arunachal Pradesh State is having the lowest agricultural productivity and exhibited least performance in almost all human development indicators. The "Connectivity" remains a major obstacle for the development. It is expected that application of new ICT tools play a major role in the development of the region. However, the e-readiness assessment report 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. Considering the existing scenario and potential of ICTs, the Centre for Development of Advanced Computing (C-DAC), Hyderabad and the Central Agricultural University (CAU), College of Horticulture and Forestry, Pasighat, Arunachal Pradesh jointly implemented a research project entitled "Creating Model e-Villages in North-East India", an innovative e-Governance initiative for the agricultural and rural development, since 2008. The Model e-Village project implemented in the selected ten remote tribal villages with the main objective of creating the computer infrastructure in the remote tribal villages and to provide regular e-awareness and e-literacy programmes and also to experiment local need based IT applications in the area of agriculture, health, education, governance and other areas (www.modelevillage.in).

Project Methodology

The e-Village project implemented in the selected 10 remote tribal villages in East Siang district of Arunachal Pradesh State, North- East India. The selected villages are located at the center of rural area, so that people from surrounding villages will have an access to the IT infrastructure. One project facilitator was selected from the same or near by village to act as a facilitator and trainer in the village IT centre. The project facilitator and group of selected village council members are responsible for conducting regular e-awareness and e-literacy programmes. Regular computer training classes were conducted to the children, village youth and others. The project research fellows and facilitators are experimenting local need based IT applications in the area of agriculture, health, education, governance and other areas.

Project Activities : Part-I

a. Village Awareness Meetings and Identification of e-Villages

During July 2008 to September 2008, village level ICT awareness meetings and focussed group discussions (FGDs) were conducted to identify suitable villages to host ten e-Village centres in the East Siang district of Arunachal Pradesh.

b. Villagers' Information Needs Assessment

After the identification of the villages, villagers' information needs on agriculture, education, health, governance *etc.*, were identified through Participatory Rural Appraisal (PRA) methods, group discussions and semi-structured interview schedules.

c. ICT Capacity Building Workshop for Facilitators

Twenty number of e-Village and e-Arik project staff participated in the six day workshop on "ICTs for e-Village Knowledge Facilitators". Technical sessions on e-Village project-backround, objectives, working mechanism, basics and advances of IT, internet and its tools, InDG web portal and national level web portal initiatives for the agricultural and rural development, use of Television and radio in the farm technology transfer, application and entrepreneurial aspects of IT and they also visited the e-Arik village knowledge centre, Yagrung village of East Siang District of the Arunachal Pradesh State. During the workshop, "Training Manual on Fundamentals of IT for Knowledge Centre Operators", a practical manual published by the India development gateway (InDG) initiative of the C-DAC, Hyderabad has been distributed to the participants.

Project-Activities : Part-II (e-Agriculture)

1. Online and Offline Access to the Agricultural Resources

The e-Village centres are equipped with wireless internet connectivity for online access of agricultural and rural development related resources. However, considering frequent power failure and weak signal for internet connectivity, number of offline resourses is made available at the centres. Especially, InDG webportal (www.indg.in) contents are made available to the villagers through e-Village centres.

2. Convergence of University Education, Research and Extension Programmes with e-Village Centre

All the research and extension activities of the College of Horticulture and Forestry, CAU and Krishi Vigyan Kendra, East Siang district, Pasighat are carried out at the ten e-Village centres. Further, final year B.Sc (Horticulture) students internship (Rural Horticultural Work Experience) Programme also conducted at the e-Village centres. Farm demonstrations, Scientist-farmers interactions, Kissan mela and awareness programmes were conducted at the e-Village centres.

3. Advanced Farm Technology Demonstrations by the e-Village Project Fellows

Advanced farm technology demonstration on rice and khasi mandarin cultivation, organic farming, mushroom cultivation and processing & post harvest aspects were demonstrated to the tribal farmers using e-Village ICT facilities.

4. KVK Extension Activities at the e-Village Centres

The Krishi Vigyan Kendra, CHF, CAU, Pasighat also adopted all ten villages having e-Village centres for conducting vocational training, front line demonstrations and on-farm research. The KVK uses resources and infrastructure of e-Village centres to impart effective training to the rural tribal farmers.

5. Research Projects

Field based research activities also carried out by the faculty and research team members of the College of Horticulture and Forestry, Pasighat in the ten villages which is hosting e-Village centres. The farmer participatory research approaches are proved successful in ensuring farmers' participation.

6. Village Adoption Scheme of the Central Agricultural University

The College of Horticulture and Forestry, CAU, Pasighat and e-Village team to adopted Berung village for popularizing the "Giriraja & Girirani", a high yielding poultry breed. One thousand Giriraja chicks were distributed to more than 20 farmers at the e-Village centres. Multimedia based training programme on "Giriraja- For Profitable Poultry Farming" was carried out under the Village Adoption Scheme of the Central Agricultural University, College of Horticulture and Forestry, Pasighat.

7. Rural Horticultural Work Experience Programme (RHWE)

Every year, the final year B.Sc (Horticulture) students of College of Horticulture and Forestry, Central Agricultural University (CAU), Pasighat along with e-Village research team engaged in the basic socio-economic data collection and conducting awareness programmes, tree plantation campaign, mushroom cultivation, vermi-compost, soil sampling and testing, horticultural products processing, landscaping and flower arrangement trainings were conducted at the e-Village centre during their month long village stay internship programme called Rural Horticultural Work Experience Programme. Students also conducted kissan mela by demonstrating need based low cost and green technologies by conducting village survey and farmers technological need assessment. The technologies such as; mushroom

production, vermi-compost, flower arrangement and bouquet preparation, low cost zero energy chamber for storage of vegetables and fruits, processing of vegetables and fruits, multimedia awareness campaign on potential on rubber cultivation, management and processing and marketing in Arunachal Pradesh was demonstrated practically and also exhibited in the kisan mela stalls. The multimedia presentation was organized at village community hall.

8. Environmental Awareness Programmes

The e-Village team periodically undertakes environmental awareness programmes by showing multimedia based awareness programmes, tree planting, awareness lectures, discussion, quiz competition and cultural programme *etc*. On 5th June, 2009 e-village team joined with villagers to celebrate the World Environment Day with the theme of "*Your Planet Needs You! UNite to Combat Climate Change*" and joined the United Nations Environment Programme (UNEP)'s "Billion Tree Campaign". Final year B.Sc (Horticulture) students of College of Horticulture and Forestry, Central Agricultural University (CAU), Pasighat adopted Berung e-village to celebrate world environment day and Berung joined "UNEP's Billion Tree Campaign", each family of Berung village, e-Village team members and College of Horticulture and forestry students planted nearly one hundred tree saplings.

9. Computer Education and e-Literacy

Regular computer education and e-literacy programmes were conducted for the benefit of tribal children and youth and other villagers in the ten e-village centres. Three month training programme on basics of computer and internet were conducted for the school going tribal students. So far more than 500 students have completed computer training at the ten e-Village centres.

10. Multimedia CDs

Advanced crop production technologies, Rubber cultivation, Integrated Pest and Diseases Management (IPM), Citrus e-Clinic CDs, Medicinal & Aromatic plants and Nutrition CDs by the C-DAC, Hyderabad, Cure@home CD by C-DAC, Pune *etc.*, were distributed to the e-Village centres and shown to the tribal farmers regularly.

11. National Seminar & Exposure Visits

The national seminar on "ICT4ARD" was conducted at Pasighat, Arunachal Pradesh on 9th to 11th September, 2009 and 80 participants from India, one from USA, members of the e-Village research team and large number of farmers were participated and seminar delegates had exposure

visits to the e-Village centres and had an interaction with the farmers of the e-Villages.

12. TV-DTH: Awareness, Education & Entertainment

The e-Village centres also having TV and direct to home connection and villagers are shown awareness, educational and also entertainment programmes at the e-Village centres.

Conclusion

Field experiences shows that farmers are very keen to get agricultural related information from the e-Village centre. However, they feel that along with e-Resources, field level demonstrations are must to understand advanced farm technologies. Even though, they understand the importance of agriculture information for livelihood generation, they are unwilling to pay even a nominal fee. Because, they feel that providing agricultural information is a public good and welfare activity of government institutions. But, interestingly, nine out of ten e-Village centres are hosted at the infrastructure (house & furniture, electricity connection) provided by the community at free of cost. Even, some of the e-Village centres farmers are willing to share expenditure on consumables (printer cartridge, paper *etc.*). Computer training to the village children are very much appreciated by the villagers. The community members voluntarily participated in large numbers in all the e-Village programmes. Considering, inadequate local need based content, language problem, inadequate ICT infrastructure (telephone, internet), road and other communication facilities in Arunachal Pradesh, integrating conventional extension approaches with ICTs (e-Village centres) emerged as a appropriate mechanism for agriculture and rural development in remote and backward rural areas.

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