Case Study

Model e-Villages in North East India

An ICT Project for Development in Remote Tribal Areas

April 2012

Governance Knowledge Centre

Promoted by Department of Administrative Reforms and Public Grievances
Ministry of Personnel, Public Grievances and Pensions, Government of India
http://indiagovernance.gov.in/

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Executive Summary

The North East India is a reservoir of rich mineral, water, forest and other natural resources. Agricultural self sufficiency and food security is a distant dream to be achieved for a stable economy and healthier and sustainable society. Lack of modern technology is considered as a prominent reason affecting productivity of agricultural commodities. In this scenario, the Government of India introduced a visionary initiative, the Community Information Centre (CIC), to take information and communication technology closer to the grassroots. However, the scope of CICs are limited to district headquarters only that restricts its accessibility to people from the remotest parts of the region.

It is in this context, to escalate agricultural growth through generation of information on new technology and methods, and to spread e-literacy among the disadvantaged tribal community, especially among the youth residing in the remotest parts of north east, the Model e-Village Project was designed By the Centre for Development of Advanced Computing (CDAC), and the College of Horticulture and Forestry (CHF), Central Agricultural University, Arunachal Pradesh.

The pilot of the project was started in 2008 in select 10 villages of East Siang District. The reason for selecting these villages for the pilot was their strategic location, which made it easier for people in adjacent villages to access the services as and when required. The project undertook a plethora of measures to create e-awareness and e-literacy among tribal community by development of computer infrastructure. It seeks to explore appropriateness of the rural ICT application and to develop an integrated sustainable model for ICT based services for North-Eastern states, with special focus on agriculture and allied areas. It also aims to study the use and impact of Indian Development Gateway's products and services specific to North-eastern region.

The major achievements of the project lie in infrastructural development in remotest areas of the country, creation of an environment of e-literacy and e-awareness, impact on a large number of participants who benefited from training programmes on farming and allied sectors, introduction of new technology and creation of an entrepreneurial spirit among farmers.

The project is funded by the Department of Electronics and Information Technology (DeitY), Ministry of Communications & Information Technology, Government of India. The initial funding for the pilot was up to May 2010 that was later extended to March 2011. The scale up proposal has already been submitted to DeitY through C-DAC for approval.

Methodology

The Model e-Villages Project in North East India lends itself to being considered a best practice owing to its uniqueness in providing e-literacy to remote tribal communities residing in the North Eastern part of the country with the objective of uplifting the agricultural economy and allied sector.

The Governance Knowledge Centre (GKC) team used both primary and secondary research methods to prepare this best practice documentation. Even though it has had a substantial impact, the initiative has not been extensively documented. Conducting desk based secondary research that mainly comprised of news paper articles, the team gathered important information on the background, objectives and operations of the initiative. In order to validate the secondary research findings and to know more about the project, Dr. R. Saravanan, Co-principal Investigator of the project from the College of Horticulture and Forestry (CHF), Central Agricultural University, was interviewed. Although the research is believed to be comprehensive, the documentation may have some information bias since the beneficiaries could not be contacted for interviews.

Background

The north east region of India is well endowed with rich natural resources, soil, water facilities, which pose tremendous potential for agricultural development and economic growth. With 70 percent of people being involved in it, agriculture is the mainstay of the economy. Despite this, the region continues to be a net importer of food grains even for its own consumption. A prominent reason for low agricultural growth is the low adoption of modern technologies, which has plagued agricultural subsistence and propelled issues in food security, mainly in remote tribal areas.

In order to bridge the digital divide, the Government of India developed a project called the Community Information Centre (CIC) in the year 2002. This project was designed mainly for the eight north eastern states of India with the basic objective of bringing multifarious benefits of Information and Communication Technology (ICT) to the grassroots in the remotest regions. Apart from providing basic services of IT education and training, CICs established under the National e-Governance Plan (NeGP) seek to leverage ICT to modernise agriculture. Some of the CICs host an agricultural marketing portal that captures the current prices of various agricultural commodities from markets across the states.

However, the geographical scope of the CICs is limited to the district headquarter level. People based in remote locations have to travel to district headquarters to avail the services, which is

especially troublesome for those residing in hilly regions with poor transportation facilities. On realizing this shortcoming of existing government efforts to extend e-literacy for improving agriculture and allied services, a project was designed to take technology closer to the remote tribal communities for improving farming practices and crop yields.

This project, named the Model e-Village Project, was designed and implemented by the Centre for Development of Advanced Computing (C-DAC) and College of Horticulture and Forestry (CHF), Central Agricultural University, Arunachal Pradesh. It has been piloted in 10 select villages in East Siang District of Arunachal Pradesh, predominantly inhabited by the Adi tribal community.

Objective

1. To create e-awareness and e-literacy among tribal community by creation of computer infrastructure.
2. To explore appropriateness of the rural ICT application and to develop an integrated sustainable model for ICT based services for North-Eastern states, with special focus on agriculture and allied areas
3. Study the use and impact of Indian Development Gateway's[1] products and services specific to North-eastern region.

Project Design

Key Stakeholders:

The pilot model e-village project is designed by the Centre for Development of Advanced Computing (C-DAC), Hyderabad, and implemented in partnership with the College of Horticulture and Forestry, Central Agricultural University, Arunachal Pradesh.

[1] India Development Gateway (InDG) is a nation-wide initiative, supported by DIT and executed by C-DAC, Hyderabad. InDG facilitates rural empowerment through provision of credible information products and services in local languages that respond to the real and strategic needs of the unreached. InDG is currently offering region specific content in sectors like agriculture, health, primary education, social welfare and e-governance etc.

Role of C-DAC, Hyderabad	Role of CHF, Arunachal Pradesh
1. To establish computer infrastructure in the selected villages	1. To select at least 10 villages in East Siang village for the project
2. To provide equipments and accessories for documenting the project progress	2. To document the project progress with photographs and video components.
3. To provide offline multi lingual content developed by India development Gateway (InDG)	3. To identify the information needs of the people
4. To train the Project Facilitators and Research Fellows in hardware maintenance and ICT applications	4. To assist in recruitment and mentoring of Project Facilitators and minimum 2 Research Fellows for 10 villages
5. To provide financial assistance for conducting awareness workshops and conferences with invitees from all over NE	5. To extend content support in the form of domain knowledge for project implementation
6. To monitor the project progress at regular intervals	6. To built network of partners with existing NGOs and government organisations
	7. To assess the socio-economic progress in the project area
	8. To develop a sustainable model for maintaining developed infrastructure even after project completion
	9. To maintain proper records of financial operations and forward those to C-DAC, Hyderabad at regular intervals
	10. To promote, proliferate and disseminate use of ICT among villagers

Work Flow

The pilot phase of this project started in June 2008 and was scheduled to be completed in May 2010. However, the funding for the project was extended up to March 2011 later.

Selection of the pilot location and base line survey

Ten tribal villages of East Siang district were selected for implementation of the pilot project. The criterion of this selection was the strategic location of the villages. These ten out of a total 132 villages of Siang district are located at the centre of village clusters, which helps the people from surrounding villages to access IT infrastructure and knowledge.

Figure 1: A Model e-Village Centre

During the beginning of the first quarter of the project, a baseline survey was conducted to understand the local context of the communities to enable shaping of the project in a way that would be reflective of the needs and aspirations of the community and would not just be a top-down project imposed on the people without seeking their meaningful co-operation. The survey measured the existing status of farming activities and indicated farmers' demand for information to improve their current status. The findings also helped the team in taking note of the community's preferred source of information, approach to address the targeted subject areas and in generating need based content. Along with the survey, focus group discussions were also held with the tribal council members, village *mukhiyas*, school teachers, village youths, officials of developmental departments in East Siang district during the first quarter in 2008.

Infrastructural development

With the inauguration of model e-village project in June 2008, ten e-village centres were set up in Berung, Sille, Ngorlung, Detak, Mikong, Mirem, Miklung, Sikabamin, Yagrung and Ayeng, covering the entire Siang district having 132 villages. These centres were equipped with

computer, printer, scanner, wireless internet connection (EVDO[2]) and DTH (Direct-to-Home) TV and provide printing, scanning and internet facilities to the villages. A mini library with technical publications in agriculture and allied sectors was also established to facilitate e-knowledge in agriculture among the community. The community took up the responsibility of providing location, furniture and electricity for the centre.

Human resources

A Project Facilitator (PF) is recruited to manage the functioning of the e-village centres. The incumbent is required to have a diploma in computer education and proficiency in the local Adi dialect, experience in data collection, and willingness to stay in villages to work in close association with the local people. Apart from maintenance of the information centre, mobilisation of the community and facilitation of ICT education among them are the main responsibilities of a PF. In order to mobilise the community for ICT education, village level meetings are regularly conducted with different groups, such as of farmers, women, children, and their information needs are identified to enable customisation of the project designs as well. The PF is responsible for updating the project reports for the benefit of the Research Fellows.

A Research Fellow (RF) is one who guides the PFs in undertaking various programmes to spread e-literacy among tribal communities. RFs are required to have a minimum educational qualification of B. Sc (Agriculture)/ B. Sc (Horticulture), working knowledge in computers, proficiency in data collection and experience of having worked in remote rural areas. The responsibilities of a RF start with the selection of villages and identification of suitable persons for operating the centres. Other functions carried out by a RF include preparation of activity charts for operators, structuring of training programmes, development of local language content for agriculture, health and adult literacy related topics and provision of assistance to the technical team in developing multi-media components. On the basis of project reports received from PFs and ground experiences, RFs conduct periodic assessment of work in selected villages and report the status of the project to the investigators from C-DAC, Hyderabad.

C-DAC, Hyderabad deploys Project Investigators (PIs) to provide technical support in design and deployment of infrastructure in the e-village centres. The PIs are also responsible for

[2] EVDO stands for Evolution Data Optimised that is a telecommunication standard for the wireless transmission of data through simple radio signals, particularly for broadband internet access.

preparing e-learning modules and facilitating ICT related training programmes to the facilitators and research fellows. They work in close collaboration with the co-principal investigators from the CHF, CAU.

The CHF, CAU recruits 10 project facilitators to oversee functions of 10 piloted centres and 2 research fellows and guides them in selection of 10 villages for the pilot. CHF, CAU is responsible for building content and providing domain knowledge with respect to important crop production techniques, market intelligence, horticulture, forestry, agriculture, floriculture etc. The CHF, CAU as the co-principal investigator assesses the socio-economic changes in the project areas and assists the research fellows in documenting the project progress with multimedia components.

Integration of existing networks

The Model e-Village Project has adopted an integrated approach that seeks to provide a platform to all the existing agents working on agricultural growth and expansion for the local communities. Krishi Vignan Kendras (KVK) of CAU and other agriculture subject specialists along with local NGOs and government departments are brought together to work in collaboration to bridge the digital divide and to leverage state of art technology for remunerative agriculture and food security.

Training programmes

As a part of the project, the e-village team organised need-based training programmes to build the capacity of different sections of the community. Free of cost sessions on computer and IT tools are designed for villagers, especially the youth and children, and special sessions on agriculture and allied sectors such as animal husbandry and fisheries are conducted for women and farmers. Each of these training programmes was of one day duration and was conducted by experts from CHF and KVK. The thematic areas of these programmes pertained to issues of agriculture, accessibility to outside markets and children's education. On the basis of the discussions, information needs are taken note of to customise project strategies. After the training programme, follow up exercises were conducted by the project team to obtain feedback on usefulness of the training sessions.

Figure 2: The e-awareness programme at an e-village centre

Several training programmes were also conducted by research fellows with the focus of spreading e-literacy

and sensitising on importance of ICT in everyday life to farmers, teachers, women, youth and children within the communities.

Along with these training programmes for the community, the project scheduled regular capacity building workshops for e-village centre operators and research fellows on IT skill building, conducting socio-economic surveys at village level, hardware maintenance, information security awareness and documentation.

Funding

This project is funded by the Department of Electronics and Information Technology, Ministry of Communications & Information Technology, Government of India. The initial funding for the pilot was up to May 2010 and was later extended to March 2011. The scale up proposal has already been submitted to DeitY through C-DAC for approval.

Table 1: INR in Lakh. Expenditure statement for the period 1st May 2008- 31st May 2011. Source: CAU

	Expense Head	*Expenditure at CHF-CAU*	*Expenditure at C-DAC, Hyderabad*	*Total expenditure as on 31st May 2011*
1.	Manpower	17.20	5.60	22.80
2.	Consumables	2.80	1.20	4.00
3.	Travel	2.25	2.25	4.50
4.	Contingency	-	1.00	1.00
5.	Capital (permanent) Expenses	-	13.61	13.61
6.	Computer professional service	1.00	1.00	2.00
7.	Conducting workshops/trainings	3.92	1.68	5.60
8.	Others	4.83	2.07	6.90
	Institutional charges @ 10%	3.16	2.88	6.04
	Total	**35.16**	**31.29**	**66.45**

Impact

The pilot Model e-Village Project was operational for 3 years in 10 selected villages of East Siang District. As this pilot project emerged as a success, it has proved that replication of model

in other remote areas, particularly the tribal areas of North East India, has the potential to bring positive changes in people's education and livelihood opportunities.

Establishing IT infrastructure in remote tribal villages

On the basis of surveys and FGDs conducted, the project identified the information and IT needs of the community and subsequently built up infrastructure to initiate an e-village project in 10 locations of East Siang District. Although the pilot could set up only 10 centres, the strategic geographical location of the centres made it easy for adjacent villages to access it as and when required. The project also gave employment opportunity and built skills of 10 local youth by employing them as project facilitators.

Creating e-literacy and building capacity of the community

During the pilot phase of the project, 54 training programmes were conducted that benefited 1640 farmers (in total 10 centres), including women, in obtaining important updated information on agriculture and its allied sectors. Seven community e-awareness programmes conducted through e-village centres also benefited more than 800 students.

Success story from Berung village:

Berung is a picturesque village located to the south of Pasighat town and inhabited by 70 families, most of who depend on agriculture for their principal source of livelihood. In non-farming seasons, the villagers adopt livelihood options such as poultry rearing and piggery. In an effort of boost animal husbandry efforts, the e-village project developed a special breed of chicken for mainly hilly areas, known as Giriraja. After initial awareness programmes, Giriraja chickens were distributed at a minimal cost of INR 5 per chicken. After a chicken grew up, it weighed around 5-6 kilograms and fetched a price of INR 200 per kilogram. Eggs also are sold at INR 5 per egg. The making of poultry feeds are also easy and require only locally available farm products such as maize and rice bran.

A village woman, Mrs. Basor Dai started with around 20 chicks. This step made her economically empowered and built her courage and capacity to take new entrepreneurial ventures.

Introducing new technology and entrepreneurial skills to improve agriculture

In a bid to introduce farmers to newer technology and innovations in agriculture, the project documented various approaches and initiatives such as the System of Rice Intensification (SRI), composite fish culture, poultry rearing, encouraging rubber plantation in *jhum* land and rubber nursery based entrepreneurship ventures. These content are made available to the community through the e-village centres. Apart from these, multimedia CDs on medicinal and aromatic crops, post harvest and processing technologies for fruits and vegetables are distributed for the benefit of farmers. Regular information is also disseminated on local market and weather data.

Building network of partners

Partnerships have been established at different levels to harness maximum benefits from the existing network of different local level organizations. The e-village team has worked in close collaboration with the Krishi Vignan Kendra, Rubber Board and State Agricultural Departments, which had mainly helped in designing and implementing a comprehensive capacity building programme.

The Departments of Health and Education of the Government of Arunachal Pradesh have also shown interest in collaborating with the Model e-Village Project to roll out their community programmes through the centres.

Piloting of India Development Gateway (InDG) and C-DAC products

This project helped in disseminating multilingual content of India Development Gateway

Quantitative indicators of project achievement

- 28 percent increase in adoption level of new technologies among farmers.

- Compared to the survey conducted in the first quarter, the analysis done after completion of the project indicates an increase of 12 percent in the overall income level, which occurred due to adoption of new farm enterprises, new crops and new technologies.

- More than 70 percent of school children, aged between 9 and 17 years, obtained education on basic computer applications.

Source: Project assessment report of CHF, CAU

(InDG) portal mandated by C-DAC, which are related to agriculture, health, primary education, rural energy, e-Governance and social welfare. The InDG portal is developed in 10 languages for empowering rural communities with knowledge and ICT based products and services. Apart from this, the Cure@Home multimedia health content developed by C-DAC, Pune were also successfully piloted through the Model e-Village Project.

Challenges in Implementation

Inculcating attitudinal changes in the community

As the project aims to create a culture of e-education and use of e-information in everyday life, the challenge of bringing in attitudinal changes came across as the most difficult of all. However, a series of meeting with the village heads were able to convince them about the usefulness of the project. The focus group discussions with the community were instrumental in sensitising the community regarding the benefits of ICT for agriculture and education.

Irregular supply of electricity

Once the centres were set up and training programmes started, the enthusiasm of the community increased remarkably. But this enthusiasm was dampened by the problem of frequent power cuts in the villages, which led to under utilisation of the e-village infrastructures.

Limited geographical scope

As the project established partnership with only the East Siang District, the scope of extending project benefits to farmers and communities of other North Eastern regions were largely limited.

Lack of existing content

Due to the unavailability of existing content and training modules, large resources had to be utilised by the CHF and KVK for generating content and training programmes to facilitate knowledge flow among the targeted population.

Conclusion

The success of the Model e-Village Project indicated a strong case for replicating similar models in various remote areas of India. Although the pilot of the project is over, scale up proposal has already been submitted to the Department of Electronics and Information Technology, Ministry

of Communications & Information Technology through C-DAC for approval. In order to showcase its potential for replication, a national level seminar on ICT for Agriculture and Rural Development was organised at Pasighat, Arunachal Pradesh on 9-11 September, 2009. The seminar was attended by 75 participants from different parts of the country. In order to better demonstrate the project operations, the participants were taken to the e-village centres and had interaction with the community.

In order to showcase the project design and to celebrate its success, the project module was presented in 4 national level conferences, namely eIndia 2009, Hyderabad (25-27 August, 2009), eNorth East-2010, Guwahati (May 2010), eIndia 2010, Hyderabad (August 2010), and GGA-MSSRF- Annual Conference, University of Mumbai (27-28 November 2010).

In a bid to address the frequent power cut challenge of the project, a partnership is proposed with The Energy and Resource Institute (TERI) to set up solar powered e-village centres to meet the power requirements of the centre and creating possible business opportunities at village level.

There is an urgent need to ensure sustainability of the centres, keeping in mind that the process must not burden the end user with financial cost for availing the services as the target population is mostly the disadvantaged tribal farmers. In a move to attain sustainability, the project plans to introduce certificate courses on computer application in its next phase. The project team has completed preliminary discussion with ISRO-North Eastern space Applications Centre, Shillong for converting the e-village centres as Village Resource Centres[3].

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[3]The Village Resource Centre (VRC) programme was initiated by ISRO during the year 2004, to facilitate overall development at village/community level by delivering the variety of space technology enabled products and services directly to the grassroots.

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Appendix A- Questionnaire

Background

1. The model e-village project was started in June 2008. What was the motivation behind implementing this project?
   a. The government of India launched the Community Information Centre (CIC) project in 2002 to bring the benefit of ICT to the grassroots in the remotest regions of India, particularly in eight North-Eastern states. Apart from providing basic services such as IT education and training, CICs established under NeGP provide citizen centric services in health, education, agriculture etc. The model e-village project has similar objectives. What, therefore, was the reason for implementing the model e-village project in the region, when the CICs already exist to cater to similar requirements in North-East India?

2. The pilot of this project was completed in 2010. Has this been up scaled up as a full-fledged project in North-East?
   a. If yes, what is the present status of the project?
   b. If no, what were the reasons for not scaling up the project?

3. The pilot was implemented in 10 selected tribal villages of Siang district in Arunachal Pradesh. What were the criteria for selecting these villages for the pilot?

Stakeholders

4. According to our research, Centre for Development of Advanced Computing (CDAC) and College of Horticulture and Forestry, Central Agricultural University are the key stakeholders of the project. Can you explain their roles and responsibilities in the project?

Working design

5. The project is implemented through establishment of e-village project centres. What is the organizational structure of these centres?
   a. According to our research, the kiosk operators and project facilitators run the centre and conduct the training programmes. Can you elaborate on their selection criteria, roles and responsibilities?

6. Our research indicates that the main function of the centres is to create e-awareness and e-literacy among tribal community by creation of computer infrastructure. Do the centres perform any other function?

a. What kind of programmes were undertaken to create e-awareness and e-literacy among the tribal community?
b. How many training programmes have been organised by the centres? Please provide details of the training provided in terms of participants, resource persons, exact content, methodology, duration, and follow up mechanisms, if any.

7. According to our research, a socio-economic survey was conducted in the selected 10 project villages. What was the reason for conducting the survey?
   a. When was the survey conducted?
   b. What were its major findings?
   c. How have its findings been used in project implementation?

Funding

8. According to our research, the pilot project was funded by the Department of Scientific and Industrial Research (DSIR), Ministry of Science and Technology, Government of India. Were there other funding agencies as well?
   a. What were the major expenditure heads in the project? Can you provide us a breakdown of initial costs for setting up the site preparation, equipment, technology, man power etc?

9. What are the reasons for studying the use and impact of Indian Development Gateway's products and services specific to North-eastern region under the project?
   a. How has this project been instrumental in creating knowledge on pragmatism of India Development Gateway's product and services for the North-East region?

Challenges

10. What were the major challenges faced in the designing and implementation of the project?
    a. How have these challenges been overcome?

Impact

11. What are the major achievements of the project?
    a. Has there been an increase in e-literacy among the tribal population? If yes, what are the indicators to signify this?

12. Has the project been successful in developing a suitable rural ICT based application to foster agriculture productions in the areas? If yes, please elaborate on this success factor.

13. Has the project been replicated in any other part of north-east India or elsewhere in the country?

14. Are there any plans for re-introduction (in case of it currently being dysfunctional) or upscaling of the project?