

## **Assessment of Impact of Information Technology on Rural Areas of India**

*Implemented by*

M.S.Swaminathan Research Foundation Chennai, India. [www.mssli.org](http://www.mssli.org)

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### **Summary**

This project has established a hub-and-spoke model of data-cum-voice communication in a group of six villages in Pondicherry in South India. The village centers can communicate with each other as well as to the Internet. A hybrid of technologies is used -wired with wireless for communication and solar with mains for power supply. The hub provides connectivity to the Internet through dial-up telephone lines, and the staff there creates locally useful content. The village centers receive queries from the local residents and transmit information, collected from the hub, back to them. An important feature of this project is the strong sense of ownership that the village communities have developed towards the village centers. The other key feature is the active participation of rural women in the management of the village center as well as in using it. A system of close consultation between the project staff and the rural users has been evolved, so that information needs are realistically assessed. Quantitative data are collected on the use patterns, and stories of deriving benefit have been chronicled.

On the whole, the impact has been positive. There is significant policy interest in the project outcome.

### **Context**

The project was developed by the M.S.Swaminathan Research Foundation as part of its program of taking the benefits of emerging and frontier technologies to the rural poor. Modern information and communication technologies (ICTs) were found to have great potential to contribute in this respect. An international, interdisciplinary dialogue, organized by the Foundation in 1992, conducted an analysis of the range of issues involved. The dialogue participants concluded that ICTs would have a major role to play in promoting sustainable agriculture and rural development in the developing world. To be of use to farm families, the generic information found in the networks, including the Internet, should be rendered into locality-specific knowledge that farm families, and rural women and men, can act on. This was the model adopted for implementation in this project. The Foundation's approach to dissemination of new technologies in rural areas is premised on the statement of its founder, Professor M.S.Swaminathan: "whatever a poor family can gain benefit from, the rich can also gain benefit; the reverse does not happen". Thus' involvement of ultra-poor in rural areas (there are over 300 million of them in South Asia) in managing the use of ICTs

was considered essential for the success of this project. The other critical issue was the need to involve rural women.

The project was started in 1998 in Pondicherry in South India because it has certain initial advantages: an accessible government and reasonable telecom infrastructure (urban teledensity of 20 app.). The level of poverty is high in rural areas, where about 21% of the resident families have less than one USD per day as *family* income. An earlier program of the Foundation for community asset building based on biological technologies had been fully operational in this region and the ICT project was expected to complement this program.

### **Objectives of this project**

- ❑ Setting up of villages information shops that enable rural families access a basket of modern information and communication technologies
- ❑ Training educated youth, especially women, in rural areas in operating information shops;
- ❑ Training the rural youth in the organization and maintenance of a system that generates locally relevant information from generic information;
- ❑ Maintenance, updating and dissemination of information on entitlements to rural families using an appropriate blend of modern and existing channels of communication;
- ❑ Conducting impact assessment based on organization of surveys, participatory rural appraisal, and other appropriate methods of data gathering;
- ❑ Building of a model in information dissemination and exchange in rural areas that uses advanced information and communication technologies.

### **Methodology**

All activities were preceded by a set of detailed surveys of the region (14 villages; 22000 population) for incidence of poverty, status of literacy and education, and the state of telecom infrastructure. A separate survey was carried out with about 10% of the resident population to identify existing communication habits and channels of information flow. These surveys revealed the gaps and the local availability of skills to bridge them. A good picture of the rating of various information sources by the rural families was also generated.

Participatory rural appraisal (PRA) was used as a method to identify information needs in any community. PRA was also used to assess how far the community was willing to go in operationalising the local center, by way of making in-kind or cash contributions. This was also used in the identification of a group of individuals who would be consensually chosen by the community for managing the local center. The project staff suggested that 50% of them must be women and that they should have sufficient education (at least up to high school).

Gender sensitivity in assessment of information needs was incorporated at the inception. An expert in India, sponsored by the IDRC, was invited to give an orientation to the project staff in gender matters. Subsequently, a staff of the foundation, who had won the IDRC Gender Matters Award, was invited to join the project operations at various stages to impart gender sensitivity in needs assessment and in content creation.

Technology for gaining access to the Internet was based on a hybrid of 2-way VHF radio and the wired public telephone network. This approach provided an integrated voice and data communication capability. The data transmission was restricted to a maximum speed of 14.4 KBPS on the wireless, where Email (SMTP) or fax protocols were used. Through a PBX (office intercom-style), every village center could be connected to this hybrid network. To overcome power outages, a hybrid system of solar photovoltaic panels and grid power, interfaced by a commercially available digital circuit, was used as source of power.

The value addition center was set up in Villianur village, located in the western part of the region. The hub of the wireless system was placed here. Dial-up accounts to the Internet were also established here. This was made the project office, as well as an interface for the public and the government offices in the locality. Village centers were set up in places where the community offered secure space, free of cost. A total 01 five such village centers were set up during the project period. One of these is a village on the coast with 98% of the population involved in fishing. The total population of the 5 villages is approximately 13400 with about 47% illiteracy.

Table 1 : *Village Centers as of October 2000*

Kizhur	(Sep. 98)
Embalam	(Dec. 98)
Veerampattinam	(Apr.99)
Poornamkuppam	(Nov. 99)
Pillayarkuppam	(Apr.2000)

The village center operators were trained in PC operations and in using the data-cum voice network (Table 2). They were trained in maintaining a register to log use of the center by the local residents. Training was also imparted in basics of management, and in handling queries from illiterates. They were frequently met by the staff in the centers, and all the center operators and the staff met once every month (the last Saturday) to sort out issues. This also helped the project staff in maintaining a view of the changes in the community needs and perceptions.

Table 2 : *Training Details*

Average time for gaining familiarity with basic operations (Win 95)	2 weeks
Time taken to transact data on wireless	3 sittings
Time taken to gain preliminary knowledge of HTML	1 week
Word 97	2 days
PowerPoint 97	1 week
Use of Win 95 keyboard for Tamil Fonts	10 days

The project staff conducted the training programs and helped generate a number of locally relevant databases. They also provide the equivalent of a helpline for the village operators in training related issues.

Table 3 : *Value Addition Center (Functions)*

<ul style="list-style-type: none"> <li>❑ Entitlements to Rural Families: This database provides details of about 130 schemes which are operational in Pondicherry UT during the current Plan (up to 2002).</li> <li>❑ Families Below Poverty Line: The details of families in the communes of Ariyankuppam, Villianur and Nettapakkam have been provided in this database which has been compiled from the UT Administration and updated till April 2000. Approximately 22,000 families are listed.</li> <li>❑ Grain prices in Pondicherry region</li> <li>❑ Input prices (quality seeds/fertilisers) in Pondicherry region.</li> <li>❑ Directory of general and crop insurance schemes. Integrated Pest Management in rice crop. Pest management in sugarcane crop</li> <li>❑ Directory of hospitals and medical practitioners in Pondicherry-grouped with specialisations such as orthopaedics, paediatrics etc.</li> <li>❑ Bus/train timetables-covering Pondicherry region and two nearby towns.</li> </ul>
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The project staff have designed and developed many locally useful databases (Table 3). Many of them are frequently updated and some are updated even twice daily. A considerable part of information is accessed from the local sources, on the web or otherwise. A critical portion comes from the web, from national and international sources. All of them are transformed into locally useful material, in format (voice/digital audio, in some cases) and in language (Tamil, spoken by 98% of the population).

## Results

The value addition center in Villianur and centers in 5 villages have been fully functional (Table 4) with activities related to information dissemination, data provision and feedback collection. (These five villages are functional out of seven started, two of which were closed down due to inability of village bodies there to maintain them). The number and type of users in these centers are provided in the Table 5.

Table 4 : *Schedules in the Village Centers*

Average Working Hours (daily)	9.1
Time	0900 -1800
Average Number of Users	12.3 (per day)
Closure (weekly)	Sundays
Closure (other occasions)	local festival days
Non-scheduled closure (average number of occasions)	4.6
Average Grid Electricity Breakdown	94 min. / day

Table 5 : *Analysis of Registers in 5 Village Knowledge Centers (1 Jan 99- 30 June 00)*

Total Number of Users	15651
Females	2832
Assetless Families	4571
Illiterates	392
Persons below 14 yrs age	4421
One-time users	3674

It is significant to note that assetless, ultra-poor families are among the major users. About 18% of the users are women, which is much higher than the proportion of women users in village public reading rooms (less than 3%). This combined figure also conceals the fact that the proportion of women users in older centers is much higher. These two results are indicators of the success of the project approach emphasizing the participation of women and the assetless families. The pattern of usage (Table 6) indicates that educational purposes (such as use of CD-ROMs) and accessing government sector data are the two most important uses of this system.

Table 6 : *Pattern of Usage (in %) in the Village Centers (up to June 2000)*

<b>Voice</b>	Personal	16.33
	Programme related	1.18
<b>Data</b>	Agriculture & Fisheries	6.69
	Education & Training	32.01
	Employment	2.05
	Health	1.51
	Govt. Sector / Entitlements	40.43

There have been many instances where local residents have derived benefits from the use of data and information derived from this network. Some of them are :

- ❑ Availing farm labour insurance by landless Women; 157 women obtained this insurance
- ❑ School examination results and marksheets downloaded from the web; over the last 2 years about 2100 students in all the centers have used this option and saved waiting time by at least one week per person.
- ❑ Ease of contacting medical practitioners and veterinarians: the local databases have been found specific and useful.
- ❑ Price information related to grain sales: this is the most important benefit according every farmer (121 interviewed in June 2000) as it helps him/her with better negotiating position in dealing with price-fixing middlemen.
- ❑ Fishing hamlet receives information on wave heights downloaded twice daily from the US Naval Oceanographic laboratory. This is viewed by the craft-vessel fishermen as life- saving.
- ❑ Largest number of users find govt. sector data most useful; at least 147 individuals reported deriving benefits from housing schemes.

There are more such instances. In addition to provision of data and information, each of these centers has become a routine, operational contact point between government agencies and local families. Government departments such as agriculture, rural development, fisheries, and the State Electoral Office frequently and regularly use the village centers to dissemination information to the village families. This development has been rated well by the local families.

A significant development is the emerging interest, especially among the youth, to create content that can be shared within the network. These relate to commercial information, and about education opportunities. This is picking up pace in the last 6 months. The other is the willingness of locally-based micro-credit groups (savings co-operatives), mostly founded and operated by rural women, to establish an accounts transaction system using the data network. These are likely to be taken up during the next phase of the project.

### **Lesson learnt**

The first PANTLEG Mission visited the project site in November 1999 and conducted an intensive consultation with almost all the stakeholders in the project. It is worth summarizing the conclusions of this Mission :

- ❑ Development entrepreneurship fosters sustainability
- ❑ Pro-active intermediaries with minimal skills accelerate success
- ❑ Empowering beneficiaries has its own value
- ❑ Technology won't achieve empowerment alone
- ❑ Sensitivity to the context should be positively prescribed
- ❑ Success is a moving target, so our aim should be flexible
- ❑ Global concepts have local application when sensitively applied.
- ❑ Evaluation is time-sensitive, patience is a virtue
- ❑ Replications of principles are superior to replications of practices
- ❑ New knowledge is still needed.

The main issue of research relates to sustainability in a context where most users tend to be ultra-poor. Formation of partnerships between local bodies and the local administration appears to hold the key. Development of applications, such as an online system for community banking, will contribute to the economic sustainability of the operations. The policy context should become more favorable in view of the character of government control of basic services in the telecom sector in many countries of South Asia. This has prevented applications-oriented services from being offered at low cost. There is hope that all this is set to change soon.

The project has attracted attention of the international development experts and national policy makers. A number of key officials of the Government of Pondicherry are closely associated with preparing extension plans of the current project. Several important officials of the Union Government have visited the sites to obtain first hand knowledge. The Parliamentary Committee for Science, Technology and Space Research made an unprecedented field visit to the project and conducted its official session on-site in one of the village centers. The Space Applications Center of the Indian Space Research Organisation has formed partnership with this project for satellite-based data broadcasting experiments. (This will allow much higher speeds of downloads from the satellites directly, without the need for high speed access to local ISPs which is generally expensive). Internationally, the project received coverage in the **Human Development Report 1999**, the **New York Times** (May 2000) and has been presented at a number of international fora, such as **GK2** (Kuala Lumpur, March 2000) and the **Geneva Forum 2000**. The project was awarded the **Motorola Gold Award 1999** for innovative and socially purposeful use of 2-way radio technology.

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