
CHAPTER 10

Satcom for Extension Training

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As far back as 1975, the development and educational communication unit at the Indian Space Research Organization has been involved in experiments where the humble television and the hi-tech satellite were combined to provide broadcast education and information to districts throughout India. Now the benefits of technological advances in communication technology are being deployed for extension training at the block level. This paper describes applications of the satellite network, opportunities, and constraints, in rural development. It also presents results of a recent project in Jhabua, a predominantly tribal district in Mahdy Pradesh.

Introduction

India has been committed to the use of Science and Technology to meet the challenges of national development. Speaking at the U.N. Conference on the Peaceful Uses of Outer Space, Dr. Vikram Sarabhai, the founder of the Indian Space Programme said, “there are some who question the relevance of space activities in developing nations. To us there is no ambiguity of purpose. We do not have the fantasy of competing with the economically advanced nations in the exploration of the moon or the planets, or manned space flights. But we are convinced that if we are to play a meaningful role nationally and in the community of nations, we must be second to none in the application of advanced technologies to the real problems of man and society which we find in our country.” Thus the genesis of the Indian Space Programme was based on potential applications of space technology in dealing with the problems of a developing society.

An important task in the process of development is that of carrying information on the latest agriculture, health, and other areas of concern to rural areas. For this purpose India started agriculture extension services in the early fifties. Today extension agencies exist from the state capital to the district, block, and village levels in all areas of development like agriculture, health, family planning, social welfare, including women and children, and education. Besides these extension services there is a chain of elected representatives at state, district,

block and village levels who facilitate extension work. With the introduction of *Panchayati Raj*¹ these institutions are expected to play a vital role in the process of development. Each state therefore employs a few hundred thousand extension workers and has a similar number of elected representatives, who have to be trained and regularly updated with information related to development.

The conventional method of training and information dissemination through the extension channel has been based on a cascade model: master trainers are trained; they in turn train the trainers who go to the field level for conducting training of extension workers; extension agents carry information to the final recipients. This model has obvious disadvantages of loss of information, degradation of quality of training, long lead times and high costs. In fact the lead time of such a training cycle is so long that by the time one training cycle is completed, the second is over due. There is therefore a great need to expedite the extension process and enhance its quality. It is in this area that satellite communication can be of critical importance.

Satellite communications technology offers the unique capability of being able to simultaneously reach out to large numbers and spread over large distances even in the remotest corners of the country. It is a very strong tool to support development education. Satcom has been used both in a broadcast mode as well as an interactive mode to reach out to rural audiences at large, and to conduct training programs for extension staff as well as rural population who are participating in the implementation of development activities.

Satellite Broadcasting

India was among the first countries to explore the use of Satcom to support development and today its space efforts are recognized the world over for their wide spectrum of applications relevant to societal benefit. The efforts started in the mid-sixties when it undertook the first major experiment to use Satcom for developmental communication, namely, the Satellite Instructional Television Experiment (SITE) in 1975-76. Under this project Direct Reception Sets (DRS) were installed in 2,400 villages spread over six states, and four hours of rural development oriented programs were transmitted every day. A primary school teachers' training program was organized during summer vacations. A number of studies were conducted to evaluate the impact of SITE. Some major observations of these studies are as follows:

1. It is possible to deploy, operate and maintain community TV sets and DRS even in remote areas of a country, reaching out to 80-90 percent of the rural population.
2. Community viewing is possible, and an average audience size of 80-100 can be expected in each center.

1. System wherein five members of the village are elected and made responsible for its smooth functionin

3. Instructional programs were preferred to entertainment programs.
4. Substantial gains were possible in the areas of health, hygiene and nutrition. The most dramatic gains were registered by illiterate viewers.
5. Despite case studies of innovations adopted in agriculture as a result of TV programs, a large scale survey did not show any statistically significant gains.
6. Community access to TV tends to narrow the communications-effect gap.

A primary school teachers' training program was conducted as part of SITE in which 40,000 teachers were trained at 2,400 receive sites. The evaluation of this training indicated that a statistically significant gain was found in science knowledge content of the trainees as a result of multimedia package training. Most of the teachers felt that the training was useful. They also found that TV rather than radio was preferred for the training.

Overall, SITE established that the extension of communications infrastructure to remote areas is not only feasible, but that it can contribute tremendously to promote development/extension education and training.

The broadcast systems have several limitations when used for educational and development purposes. These include wastage and the difficulty of coordinating ground support efforts with the broadcast. Besides, broadcasting systems do not provide for any interaction between the resource person and the learner, which is essential in both educational and training situations. To overcome these limitations India has been experimenting with the use of one way video two way audio teleconferencing interactive networks for education and training. This has been found to be of immense use and has been made operational in the form of the Training and Development Communication Channel.

Training and Development Communication Channel

Configuration

The network consists of three major elements: the teaching end, the spacecraft and the classroom. The teaching end consists of a small studio and an uplink earth station. It originates the training material either in the form of "live" lectures or recorded video programs from a small studio and uplinks these television signals to a geostationary communication satellite (INSAT-2C) by means of an "uplink" earth station located at the teaching end. One extended C-band transponder on INSAT-2C has been earmarked for this purpose. The classroom has a DRS/Rx-terminal capable of receiving a signal in extended C-band from the satellite. The talkback is possible through normal STD telephone and fax connection provided in the classroom. In case a location does not have STD connection a satellite talkback terminal can be used. The question from the classroom is received at the studio and fed to the system so that it is heard live over the network to all viewers. The resource person at the teaching end

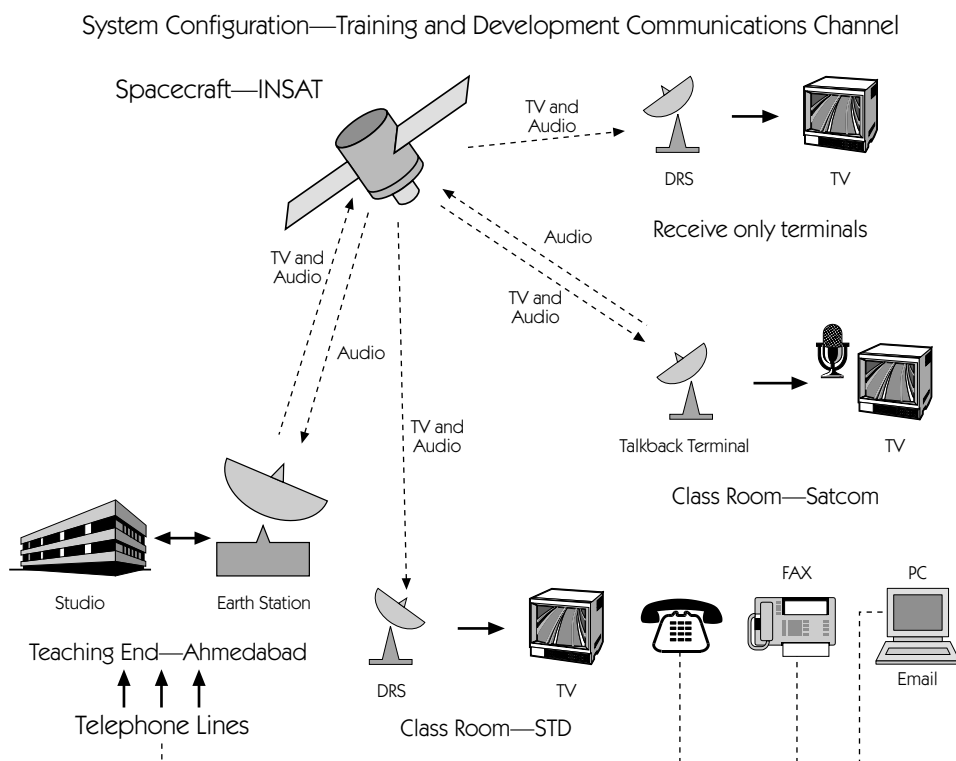


Figure 10.1 Training and Development Communication Channel

provides the answer/feedback. The system thus provides a one way video two way audio teleconferencing network, supported by a fax machine.

Applications

Three major applications of this network have emerged: distance education, rural development and industrial training.

In the field of **Distance Education**, a number of user agencies offer diploma and degree programs in a distance education mode to students all over the country. The Indira Gandhi National Open University is a leading national open university in the field of distance education. Several states have set up state level open universities. Several professional agencies like the All India Management Association and the Institution of Electronics and Telecommunications are offering diploma programs to students. These agencies have found the use of such a network most effective in reaching out to the students as well as counselors. These agencies have installed their own receive terminals for regular use of the network.

In the area of **Rural Development**, the network is finding application in the training of extension staff of various departments of the state governments. The network has been used by the Gujarat, Madhya Pradesh, Karnataka and Goa governments for training watershed management and health extension

officials. Training of rural women under the Development of Women and Children in Rural Areas program has been carried out. A very important area in which the network has been used is training of *Panchayati Raj* elected representatives, and training primary school teachers and Integrated Child Development Scheme (ICDS) workers. These are the areas in which very large numbers spread over large distances have to be trained. Only a network like this overcomes the disadvantage of distance and numbers.

In **Industrial Training** the network has been used by large multilocal organizations like the State Bank of India for training participants all over the country. The State Bank has set up a network with 46 classrooms and has conducted two training programs and plans to conduct more. It also plans to start its own network. The National Productivity Council used the network for training supervisors of seven participating industrial units. The National Thermal Power Corporation is also planning a network of its own. Large organizations such as Coal India Ltd., and the Oil and Natural Gas Corporation of India, and the defense forces are likely to find this network useful.

Utilization for Extension Education

A few examples of the areas where the network has been gainfully used are given below.

Teachers training: The governments of Gujarat, Madhya Pradesh, and Karnataka have utilized this channel for conducting seven teachers' training programs of about two days duration each. More than 6,900 participants attended these training programs. The areas covered included science, development of teaching and learning materials, educational coordination and geography. The interactions during these training programs were quite intensive; average 10 questions were answered in each of the training programs.

Tests to evaluate the effectiveness of the Special Orientation Programmes for Teachers revealed (Phalachandra 1997) the following:

- 82 percent of the participants found this method better than the traditional method of training.
- Achievement tests indicated significant gain in knowledge in five out of the nine topics covered.
- Answers given by experts were found to be satisfactory, relevant, and useful.
- The teachers found that the program was "effective," "created interest," increased their "enthusiasm" and "improved our capabilities."
- The participants and facilitators participated with enthusiasm, took an active part in the activities and adapted themselves easily to the new training technique (teleconferencing).
- Listening to the questions and answers of fellow colleagues of other centers was a worthwhile experience for most participants.

- Participants found the program more interactive, interesting and effective as compared to the traditional mode. They suggested the extension of this technology based training program to other areas such as language teaching and mathematics.

The experiment demonstrated the effective use of one way video and two way audio technology as an alternative mode of training. The teleconferencing mode was found to be feasible to orient/train individuals spread over a vast geographical area. Each team had master trainers to avoid transmission loss.

Almost all state governments have utilized the network for reaching out to the elected representatives of the *Panchayati Raj*. The Karnataka state government conducted a special program for women representatives, M.P. for the members of the block (*Janpad*) *panchayats*, and Gujarat conducted a series of programs on the *Gokul Gram Yojana*.² The Goa government conducted a 10-day training program for its *panchayat* members. The major topics related to the effective functioning of the *panchayats*, conduct of *gram sabhas* and roles, responsibilities and powers of *gram panchayats*.³

The response in all the cases was overwhelming. In the training program of M.P. more than 1,800 representatives participated. In the three days an average 100 and 2,000 questions were received on telephone and fax respectively. In Goa for a 10-day program, attendance varied between 45 and 150 per receive center with 10 to 25 questions per session.

ICDS Workers Training: The Department of Women and Child Development organized several training programs for ICDS workers in M.P. because in this state there are some 120,000 ICDS workers' assistants. It has now been realized that the only way to reach out to these numbers is by setting up a network to the block level and organizing regular training programs every month.

The network has been utilized for training and extension education in every area of development including health, agriculture, and watershed management. Several user agencies and state governments have installed receiver networks. There are 500 terminals in the network and this is being expanded to 1,500 soon. State governments are making investments to set up their own studios and uplinks. During 1998, 97 training programs were organized for over 186 days, and more than 1,000 participants were trained in each program. With the network becoming digital, it will be possible to operate several channels simultaneously.

Major Advantages of the System

- Training in the shortest period of time a large number of geographically dispersed people.

2. A village development scheme started by the Chief Minister of Gujarat. It aims at creating minimal infrastructure and facilities in each village

3. *Gram* or Village *Panchayat* is the elected body of five senior members of the village, responsible for the effective functioning of the village

- Multiplier effect by training trainers.
- Uniformity of the training content.
- Access to the best available learning resources, irrespective of the geographical location of the learners.
- Repeatability of training courses/educational packages.
- Enhanced involvement of the trainers/learners due to interaction capability leading to greater learning gains.
- System capable of allowing different user groups to share the network. Specific topics for specific locations and specific groups are also possible.
- Significant savings in expenditure due to savings in travel, logistics and replication of teaching infrastructure.

Jhabua Development Communications Project (JDCP)

This is a project undertaken in Jhabua, a predominantly tribal district of Madhya Pradesh, adjoining the western border of Gujarat state. This project combines the features of satellite broadcasting as well as interactive training at the district level.

Under this project 150 direct reception TV sets were installed in the villages and 12 satellite based interactive talkback terminals were installed at block headquarters. Every evening for two hours development oriented programs

Schematic Drawing—JHABUA Development Communications Project

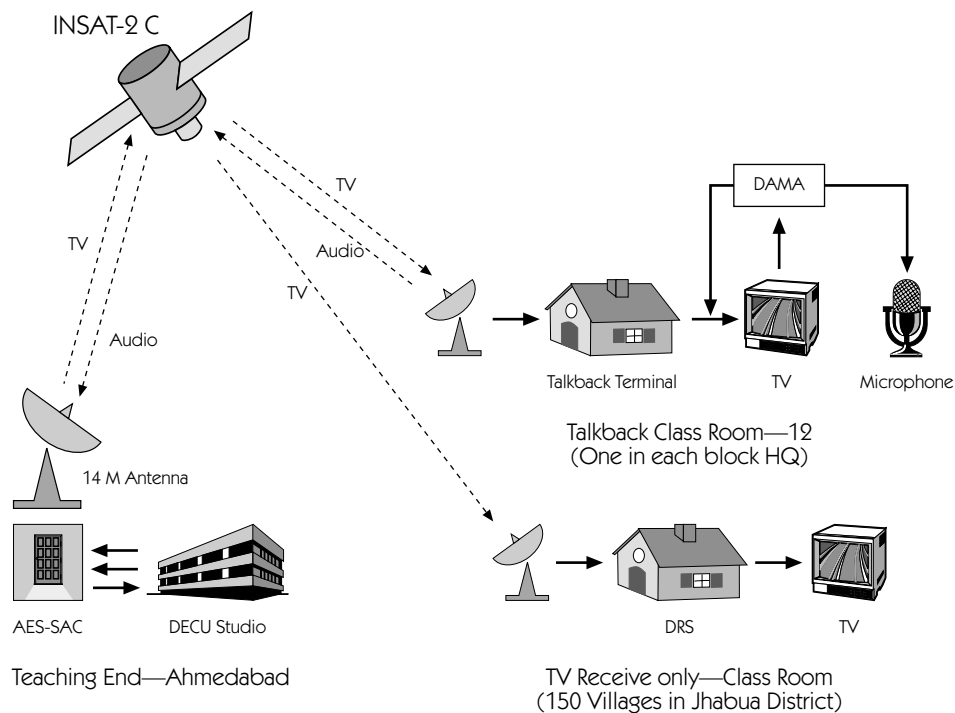


Figure 10.2 Overview of the Jhabua Development Communications Project

are broadcast over the network and the interactive terminal for training. This evening telecast provides communication support to developmental activities such as health, education, watershed management, agriculture, forestry, and *panchayati raj*. The interactive training programs cater to the training needs of a variety of block and village level functionaries, like teachers, *aanganwadi workers*,⁴ Joint Forest Management Committees, *panchayati "Karmis,"*⁵ etc.

This system, operational since November 1996, has been evaluated and studied carefully. The research was divided into three phases: Formative, Process, and Summative. A large scale survey with experimental and control villages and data collected before (T_0), during (T_1 T_2), and after (T_3) the project was conducted to determine the program's impact. The analysis indicates that

- Community viewing has reached about 35 percent of the rural population in which 17 percent were regular viewers.
- Average attendance per set per day was approximately 40 persons.
- The percentage of regular male viewers was more than double that of female viewers.
- There was a significant increase in the percentage (53 percent to 74 percent) of viewers discussing the JDCP programs after viewing them.
- About three-fourths of the viewers enjoyed watching the programs and found them informative.
- About one sixth of the viewers did not follow the programs. The T_2 survey indicated that about a half of them (7.3 percent) did not understand the language or the topic.
- In the T_1 survey, only one-fourth of respondents mentioned "farm improvement" and the percentages of those mentioning increased awareness in different areas varied from 0.5 percent (*panchayati raj*) to 9 percent (health). But in the T_2 survey, 37 percent mentioned farm improvement, and the percentages of those mentioning increased awareness in different areas rose from 20 percent (*panchayati raj*) to 28 percent (health).
- The intake of alcohol apparently decreased due to the education programs. About 20 percent mentioned "less drinking" due to JDCP.

As part of this project, interactive training programs were organized by district level authorities. The participants were expected to go to the block office to participate. District officials prepared a quarterly training calendar and conducted training programs for block and village level participants. During the project about 100 programs were organized covering joint forestry management, education, health, women's self help, agriculture, and watershed management. Most programs were of a day's duration.

4. The government has established *aanganwadī* (or creche) in each village where small children of working parents can be looked after. A village girl from each village is appointed to look after the children. She is referred to as *anganwadi* worker.

5. People who work according to directions of the village *panchayat*.

The experience of interactive training at the district level is quite different from that at the state level as described under Training and Development Communications Channel. Organizing training programs with district level resources is more difficult than at the state level due to the following reasons:

- The information supplied by resource persons at the district level and the seriousness of the resource persons is inadequate.
- Field level organization and logistic support is weak.
- Organizers run out of topics for training, and thus tend to become repetitive.
- Participants complain that no new information is imparted, and that only the tasks related to specific development schemes are repeated.
- Because of the poor organization and inadequate quality of training the participation level decreases.

Observations

The experience of utilizing the network for extension education and training over a long period and spread over different areas has indicated the following:

- The system enables one to reach out to large numbers in an interactive mode. On average, each 'receive' location has about 45 participants though the number varies and there have been situations with much larger numbers. But from a learning and interaction point of view, large numbers is not advisable. With an average of 45 participants and 20 terminals the number of participants in a training program is about 900. With networks being extended to the block level, the number of participants may increase.
- Interactivity over the network is high. Participants ask more questions than time allows to be answered. In a one-hour session, at least half an hour should be provided for questions.
- Resource persons come better prepared when participating on the network since his work gets importance, is acknowledged by much larger numbers and the situation is more challenging. This improves the quality of training.
- The seriousness of the training program increases, as the coverage becomes larger, and the level of resource persons and participation of dignitaries also increases.
- The system provides a direct access to senior officials and decision makers who would otherwise be beyond the reach of participants. This gives them an opportunity to present their problems directly to high authorities.
- Participants find this communication method interesting and effective. Learning is equivalent to face to face interaction.
- Technology is not a barrier for participants. Even illiterate persons adapt to the learning and communication environment within a few minutes.

- Logistics and organizational aspects need greater attention. Advance preparation is required to ensure participants reach the distant locations, background material is distributed, and boarding and lodging are well managed.
- The system is most effectively utilized at the state level because at the district level the quality of resource persons is not satisfactory and officials tend to take it as an additional work burden. Logistic arrangements are found to be better for state level training programs.
- It remains to be seen how the system functions when the number of classrooms increase from 20 to 200. This will be a major change and the functioning of the system will need to be reviewed.

An important issue is who in the state should operate the system. It has to be operated as a facility that several departments should be able to utilize for their training. One possibility is that it is operated by the State Institute of Rural Development. Most extension training is related to rural development, and the State Institute, which is co-located in most states with the Academy of Administration or the State Training Institute, could be an important organization to operate the system. The possibility should be explored of creating an autonomous agency to operate this facility and to see if this can be self-financed.

Future plans

The experience of utilizing the network has convinced state governments of its efficacy in extension education. Hence the existing networks are being extended to the block levels, and state governments are setting up their own “Teaching-ends” including studios and uplink facilities. Mechanisms for operations and continuous utilization of the network are being defined.

For optimal use of satellite capacity it is essential to see that digital technology is utilized. The networks will be converted to digital. This will enable simultaneous operation of four channels in place of one (using the same satellite capacity). This will also enable the addition of features like two way video from select centers and data broadcasting.

Efforts are underway to see that such networks are created in almost all states, so that this becomes a backbone for extension training throughout India. However, this would imply a major change in the extension training methods of state government agencies. They will have to be oriented to the effective use of the medium.

Reference

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CHAPTER 11

Satcom for Barefoot Women Managers

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The Self Employed Women's Association (SEWA) is a trade union representing poor, self-employed women workers. SEWA's main goals are to organize women workers to be fully employed and self reliant. SEWA has recently been using the satellite talk-back communication system to conduct educational programs that cut across a range of capacity building themes: organizing; leadership building; forestry; water conservation; health education; child development; Panchayati Raj system; and financial services. Using the satcom facility, SEWA's community groups and organizations have quick and easy communication with block and district level functionaries. This enables experience sharing and enriches knowledge bases.

Introduction

The Self Employed Women's Association (SEWA) was established in 1972. It has a membership of around 212,000 women spread over 790 villages in nine districts of Gujarat. Many areas where SEWA works are drought-prone desert areas, where there is a lack of employment, low wages, poor health, low literacy, crushing debts and high rates of forced migration, especially among men.

From twenty years of experience we have learned some hard lessons: most important, the basis of obtaining higher wages is a capacity and power to bargain. However, workers become weak and vulnerable by lack of employment. In a situation where there is almost unending supply of labor and limited employment opportunities, workers are unable to bargain for higher wages.

SEWA supports its members to organize into groups or cooperatives, so that the self employed women themselves become owners and managers of the programs. SEWA's approach has been to initiate programs based on demand, organize the women, facilitate building the member's own local organization, which then takes over the program implementation, expansion and future planning. The second major lesson is that the sustainability and self-reliance of

any program and local organization depends on its managers. SEWA works to build capacities of local managers.

SEWA has conducted training in nine districts throughout Gujarat. However, it has only one training team and its subjects are the same. Therefore, it takes time to reach members. Many demands are not met. SEWA has recently started using satellite communications in order to meet this demand for training.

The Satellite Communication Network

The network consists of three major elements: the teaching end, the receiving end, and the spacecraft.

The teaching end consists of a small studio and an uplink earth station. The training material comes either in the form of live lectures, demonstrations, or recorded video programs from a small studio and sends these television signals to a geo-stationary communication satellite by means of an “uplink” earth station.

The spacecraft receives, amplifies and retransmits the signals to classrooms within the coverage area by means of a district reception system where such interactive capabilities exist with telephones known as “talk back system.”

A small studio set up at the teaching end serves to originate live or recorded lectures and to accommodate the panel of experts who participate in the talk back sessions. The studio is linked to the uplink earth reverse direction for routing calls received from satcom talk back locations to the studio. Calls received are given to the panel of experts at the studio classroom.

Methodology

SEWA’s training attempts to transfer professional knowledge to the grassroots level to increase the competencies of its members to function with alternative models.

In order to have maximum usage and impact of this medium, SEWA first conducted a half-day orientation program. The focus was on the following:

- What is satellite communication and how does it work?
- How to design a training program?
- Selection and orientation of resource persons.
- Role of district center coordinator during the program.
- Use of question-answer session.
- Feedback and evaluation.

SEWA plans to institutionalize the satcom training program to build its cadre of “Barefoot Managers.” Our satcom training programs, each two days long, have been conducted by SEWA on the following subjects:

- Organising training for capacity building;
- Women and *Panchayati Raj*¹;
- Women and forestry;
- Women and water; and
- Savings and women.

Review of Training Programs

Organization building

The aim of the training was to educate participants to organize and to identify leadership qualities and understand the roles and responsibilities of a leader. Participants included rural members and local women leaders of SEWA from the districts. About 115 women from 9 centers participated in the talk back program. The classroom training used different types of issues as ice-breakers such as how to build a fort to bring out the importance of collective strength and the role of a leader.

Women and Panchayati Raj

In villages, *Panchayats* have turned into training grounds for women who had been excluded from a role in village politics for millennia. The aim of the program was to share with elected *Panchayat* members their experiences as heads of the *Panchayat* or members of the *Panchayat*. Also, the *Panchayati Raj* structure was explained. This was designed to increase the awareness level of women *Panchayat* members, and facilitate their playing an ever-growing role in the *Panchayat*. The participants included the *Sarpanch* (head of the *Panchayat*), members, *taluka* (a sub-unit of the district of which there are about 50,000 in India) *panchayat* members, and delegates. About 170 *Panchayat* members participated.²

Women and forestry

The aim of the program is to highlight the key roles women play in eco-regeneration. It focused on how forestry directly affects the livelihoods of rural communities, and the potential leadership role women play in regenerating forests. About 405 members participated in the talk back program from 12 districts.

1. Nearly a million women in India have been elected to these village governing councils since India adopted a constitutional amendment in 1993 that set aside a third of all *panchayat* seats and village chiefs' positions for women.

2. Like men, women *panchayat* leaders are involved in obtaining village land for schools, selecting families who will qualify for Government housing and deciding how to distribute brick lanes, latrines, electricity, etc.

Women and water

SEWA's input to the state's campaign is to increase women's awareness about their problems and possible solutions to these and highlight their capacity to address, solve and monitor problems by cooperating with government officials, village leaders, and other village members. This particular program had technical difficulties and had to be discontinued after the first day.

Lessons and Experience

The satcom talk back programs were effective in reaching a large number of SEWA groups in rural communities, within a limited period of time. Thus the organization's outreach capacity for awareness raising, sharing experience and learning increased rapidly. An average of 150 questions or experiences were shared, and some common issues came out that cut across sectors, for instance,

- When will the government announcement appointing woman *talati*³ be implemented?
- In the absence of electric supply, how can farmers cultivate?
- What can be done if primary teachers are not knowledgeable or trained?
- What if a new *Sarpanch* changes the previous *panchayat* resolutions?
- Who should be contacted to design sewerage schemes for the village?

The resource persons involved in the training summarized their conclusions as follows:

- Interactive training is useful to reach a large number of beneficiaries, and is appropriate for extension activities.
- The satcom is useful for mobilizing and conducting campaigns.
- Rural women benefit by becoming familiar with modern technology they can use.
- Barefoot managers can be trained through this medium in a variety of subjects.

Constraints

SEWA is currently using local government receiving centers and infrastructure at the district level. Often, due to lack of communication and coordination, many receiving centers do not function well. There are problems of non-reception due to a lack of technical know-how at the district level. Certain operational difficulties, such as power failure, interrupt transmission.

3. Secretary of the village *panchayat* (government employee).

Participation is also constrained due to the lack of talk back time or busy telecommunication lines. Hence, the centers have to either keep the telephone lines open or keep trying for longer time periods.

The Future

After testing this communication medium, SEWA plans to continue using it for education and capacity building particularly to build a cadre of local leaders and managers. The following programs are expected to be delivered:

- Organizing skill development;
- Minimum wages for different trades and its campaign;
- Home-based workers' recognition and campaign;
- Women and water-related programs;
- Women and forestry;
- Women and health education;
- Child development and nutrition; and
- Capacity building of barefoot (local, rural) managers through interactive sessions focusing on strategic planning, management and program administration.

Conclusion

SEWA serves largely hand-to-mouth hard working self-employed women—those making incense sticks, doing some construction job, stitching the clothes on her sewing machine at home, or selling vegetables on the streets. It is an institution of totally downtrodden women, which is now trying to expand its reach through modern information and communication technology. Distance classroom training has now been tried and usefully demonstrated as a communications tool to train women leading our programs, helping them and the programs to become self-reliant.