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**PERU RURAL COMMUNICATIONS SERVICES PROJECT:  
FINAL FIELD REPORT**

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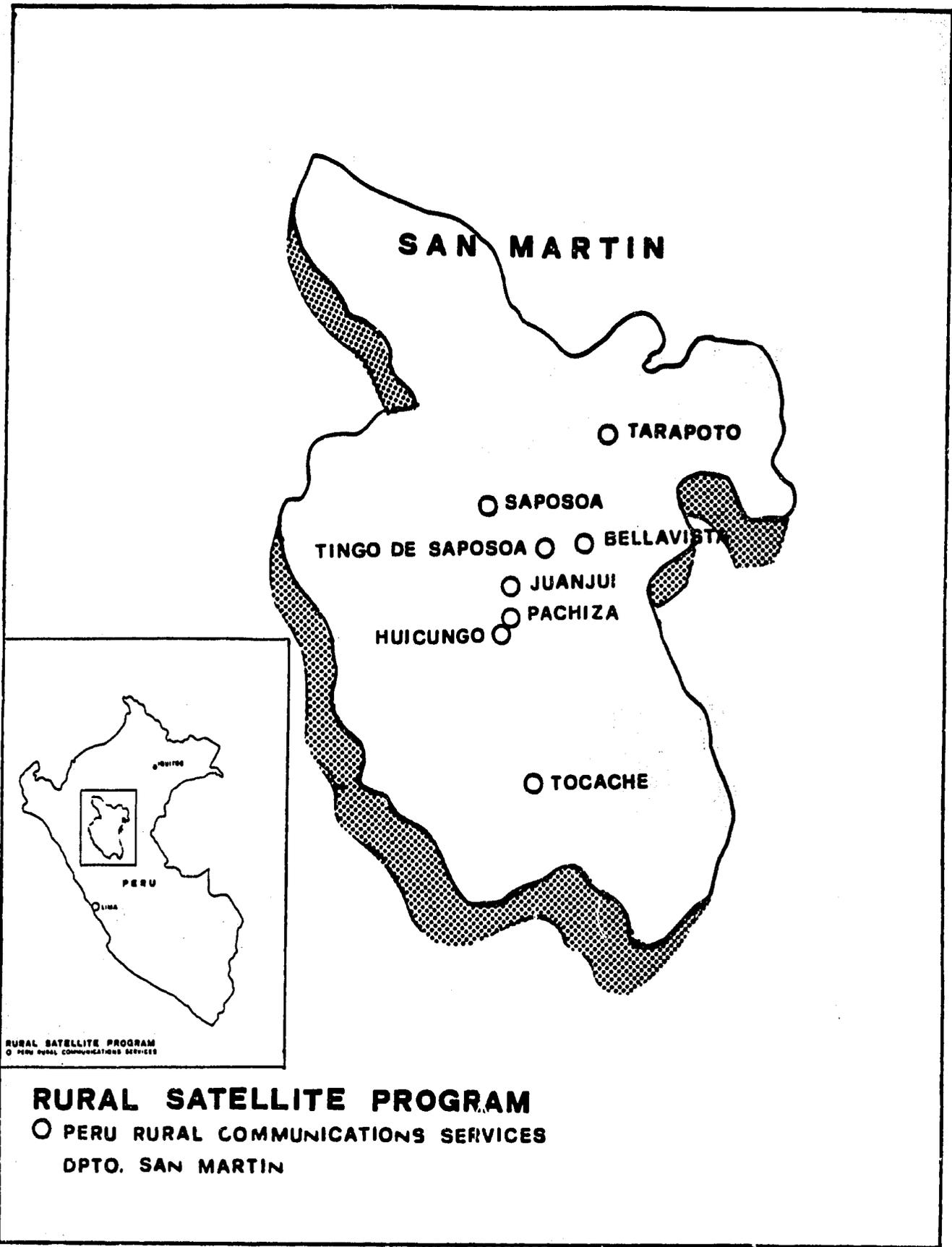
## INTRODUCTION

The Peru Rural Communications Services Project (RCSP) was a cooperative project between the Empresa Nacional de Telecomunicaciones del Peru (ENTEL-Peru) and the U.S. Agency for International Development that sought to use audioteleconferencing (ATC) as a tool to support development efforts. RCSP is one of three demonstration projects organized under AID's Rural Satellite Program which was managed by the Academy for Educational Development. RCSP was designed to support the socio-economic efforts of the Government of Peru by means of satellite communications. The project focused on reaching remote and rural areas to promote the use of local resources to improve the administration of basic social services in agriculture, health, and education. RCSP has attempted to expand the capacity and potential of those services based on local needs. The Ministries of Public Health, Education, and Agriculture worked with ENTEL in supplying those services to five provinces in the Department of San Martin: Bellavista, Mariscal Caceres, Huallaga, Tocache, and San Martin. The project was conducted in the high jungle of the Central Huallaga region.

The Department of San Martin has a population of 320,000 and a density of 5.5 inhabitants per square kilometer with a population growth rate of 3.8 percent between 1972 and 1981. Sixty percent of that population is located in towns and villages and 40 percent in scattered hamlets and small settlements. Twenty-seven percent of the population are economically active and of the total, about 70 percent work in the primary sector (agriculture, cattle raising, hunting, fishing, etc.). Seven percent are in the secondary sector and 23 percent in transport services, commerce, communications, and so forth.

The key institutions selected to implement the project included the Ministry of Agriculture, through the Instituto Nacional de Investigacion y Promocion Agropecuaria (INIPA--National Institute for Research and Agricultural Promotion), the Ministries of Health and Education, and three corresponding administrative and operating units in the Department of San Martin. Each of the participating institutions signed agreements with ENTEL concerning their responsibilities in planning and executing the program.

Audioteleconferencing was to be the best alternative for overcoming a series of obstacles and limitations in the planning, administering, and coordinating of social services in the region. The needs and the magnitude of the problems are readily identified in health data. For instance, in 1983 in the five provinces, 39 percent of the population had poor access to medical care. The total number of health personnel consisted of 75 general practitioners, six obstetricians, 74 nurses, and two health teachers. Most (62 percent) of them were located in the capitals of the provinces. In that year the health budget for that region was 1.1 percent of the Central Ministry of Health budget.



## THE TECHNOLOGY

### Configuration and Location

The RCSP network was based on a primary satellite subsystem of earth stations with 6.1-meter antennas and a secondary subsystem of VHF radio links. The earth stations were purchased from the U.S. firm Harris Corporation and are located at Juanjui, Saposoa, and Tocache. The selection of these localities was based on the technical criteria of ENTEL and the policy goals of the central and local governments. Under the same criteria, the secondary network was established in Bellavista, Tingo de Saposoa, Pachiza, and Huicungo using Hungarian BUDAVOX VHF radio links provided by ENTEL.

The network sites are very diverse in terms of population size, economic activity, and service demand. The primary subsystem focuses on urban centers with significant economic and business activity, a concentration of resources, and basic social service infrastructures. The secondary network services those areas which are more predominantly rural and dependent upon subsistence agriculture with some cocoa cultivation and rudimentary commercial activity. The economies and interregional relationships of these localities are enhanced not only by the organization and administration of the central and regional government, but also by the presence of the Marginal Highway of the Amazon jungle, which runs throughout the department and which gives access to depressed regional markets.

### Installation and Operation

Installation of the primary network was completed during the last half of 1983. Since then, only the earth station of Tocache obtained the approval of INTELSAT to operate. The other two earth stations have been operating with a temporary permit. Design and installation problems are the main cause of this lack of approval. ENTEL and Harris have discussed the problems, but they still have not resolved them. The earth stations at Juanjui and Saposoa need to have their antennas retrofitted. Harris has prepared proposals for reconditioning the antennas; however, ENTEL cannot assume the costs. There has been some disagreement between ENTEL and Harris regarding the contractual responsibility for various aspects of the purchase, installation, and trial operation of the equipment.

In the secondary network, the installation and testing of the VHF BUDAVOX equipment were begun during the last months of 1983 and were finished during the first half of 1984. Initially three localities had a VHF channel that was shared by the telephone and the ATC system. Bellavista, the fourth telephone locality, received two VHF channels which were autonomous.

Initially, the primary network of Juanjui and Tocache had a capacity for four channels (three for telephone and one for ATC) and Saposoa had three channels (two for telephone and one for ATC). The autonomy of the ATC and telephone systems, however, was achieved only in the second half of 1984. Until then, channels were used alternately by both services because of imperfections in the units.

After the installation was completed, ENTEL attempted to make the transmission-reception systems more reliable and their performance optimal within the conditions and

constraints imposed on a new communications service in rural areas. At the same time, ENTEL tried to reduce the costs of the new services through simplification of the satellite link system and the reduction in telephone channels used from ten to two. The system thereby gained greater flexibility and range. These technical changes made it necessary to move Tarapoto's ATC bridge to the earth station of Lurin near Lima.

In 1985, because of a growing demand for telephone service in the towns of Juanjui, Saposoa, and Tocache, ENTEL provided two additional channels to expand telephone services in these localities and link them with the rest of the country and the world. Saposoa, the town with the least telephone traffic, received the signal from Bellavista, thus reducing telephone traffic in Juanjui from where it was formerly being transmitted. This also increased the use of the earth station at Saposoa and created a better cost-benefit ratio.

In December 1983 and June 1984, the primary and secondary networks, respectively, were already in service, including the terminals in Lima and Tarapoto. After installation of the satellite and earth transmission systems was completed and the system was in working order, ATC services began in 1984.

The initial design of the network was changed in the beginning of the installation process by ENTEL. In the first half of 1984 a Dantel-Darome terminal was installed in ENTEL's office in Iquitos. The ATC equipment was initially planned for Moyobamba, the capital city of San Martin. Because of the limited capacity of the reception-transmission channel and the bureaucratic support requirements of CORDESAM, however, the decision was made to change the headquarters to Iquitos, an office with more authority in the administrative structure of telecommunications services of the Peruvian eastern region.

ATC rooms were installed in Tarapoto, Juanjui, and Tocache in new settings although with different characteristics. In Tarapoto, the room can hold 40 people and is air conditioned and well lighted. In Tocache, the room is small with room for eight people. When it is not being used for teleconferencing, the room is used as a work room by the engineers of the earth station. It is not well lighted and is very uncomfortable. In Saposoa, various rooms in City Hall are used for teleconferencing. The rooms change continually and, in general, are not comfortable, being too small and too hot.

In the secondary network, rooms were offered by the local town halls. These rooms do not have any air conditioning. In Iquitos and Lima, the equipment was installed in the ENTEL meeting rooms. In Lima, teleconferencing began in the International Affairs office in early 1985 but was moved to the Commercial Management Office.

Starting with these arrangements, it was expected that interactive sessions would be flexible and that there would be good group participation. It was also expected that there would be dialogue between different administrative and operational levels of each one of the three participating sectors (health, agriculture, and education) which would support the coordination of strategies and other priorities in the region as whole. To this end, ENTEL installed a field office with a coordinating supervisor in the administrative offices in Tarapoto. This office was responsible for promoting effective participation in the ATC network. It was felt that the network would provide an integrating element for the services and resources available in the area which formerly were spread out and fragmented by the lack of communications.

## NETWORK PERFORMANCE

The major challenges to the project were directly related to the technical components of the system including the satellite, earth connections, and energy system and to the installation process.

During installation and trial of the primary network, limitations were imposed by the lack of measuring equipment, an unstable supply of energy with voltage variations of up to 12 volts, and a lack of spare parts. To a great degree the transmitters were the most affected, and the three earth stations often failed during 1983 and 1984. The Harris earth stations suffered constant burnouts, decalibration, and frequency drifts in transmission and in reception. The continuous dragging and readjustment operations resulted in premature wear and weakening of the contacts. The same happened to the low frequency converters with continuous changes of temperature and energy flows in the units of the three stations. Later, ENTEL pointed out problems in the design of the earth stations which demanded retrofitting, especially in the Juanjui and Saposoa stations. These problems have not been solved despite RSP efforts to help Harris and ENTEL reach an agreement. The results of these problems, especially during 1984, were as follows:

1. Interruption of telephone and ATC services
2. Unnecessary wasting of time and resources caused by the wrong placement of components between earth stations in attempts to improve interrupted signals
3. Interruption of ATC service because of telephone usage
4. Continuous technical deficiencies in the quality of the telephone and ATC services including noise, echo, interruptions, etc.

The poor performance and reliability of the satellite transmission system was caused by a number of other factors, including:

1. The lack of adequate knowledge and experience in satellite technology on the part of the Peruvian engineers in charge of the earth stations. (ENTEL contracted recent graduates for these jobs.)
2. ENTEL's excessively bureaucratic system for the repair and maintenance of units which required taking them to Lima. In addition, the Tarapoto office did not have the necessary resources, measuring equipment, tools, and spare parts.
3. The lack of continuous and preventive supervision in the field on the part of the engineering personnel from RCSP's office in Lima.

Perhaps the biggest challenge faced by ENTEL has been providing reliable and profitable communications services in rural areas under extremely warm and humid conditions.

In the secondary network, problems are very critical. Pachiza, Huicungo, Tingo de Saposoa, and Bellavista utilized BUDAVOX VHF radio link equipment for receiving and transmitting their telephone and ATC signals through Juanjui. After the installation and testing work was completed, this network was administered by the Long-Distance Management Office in Lima through its respective section in Tarapoto. The office in Tarapoto did not have staff to carry out the preventive and maintenance work. It was not until November 1984 that a technician was obtained.

The BUDAVOX radio links immediately experienced technical problems in their multifrequency transmitters, but no spare parts were available locally. These had to

come from Lima. Something similar happened to the energy transmitters at the secondary sites and Cerro Cangrejo (the linking point with Juanjui's earth station). Some problems with transistors, magnets, etc., caused interruptions of the telephone and ATC services. Finally, because electric power is restricted to certain hours at every secondary post, it was necessary to install batteries. This system was very costly and time consuming for ENTEL's administrative office in Juanjui. The consequences of these problems were:

1. Very poor performance and reliability of the telephone and ATC services
2. High costs of maintenance and operation in relation to profitability, particularly in relation to telephone service
3. An alarming level of non-operation

There were no technical failures among the Dantel telephone terminals at each site nor the Darome audioconferencing equipment (e.g., microphones, speakers, and convener). Most of the technical problems that occurred were a result of flaws in the satellite transmission network and terrestrial links.

## PROGRAM CONTENT

After the ATC network was established, it was used to:

1. Organize the user groups in terms of coordination and participation
2. Provide information and training in interactive techniques of group communication
3. Diagnose the communications needs according to the priorities established for each sector
4. Plan together the programming of ATCs
5. Organize and administer the execution of a regular program of teleconferencing
6. Organize a system of formative evaluation for the program

During 1981 and 1982, efforts were aimed at obtaining agreements among the sectors to establish:

1. Responsibilities and roles in the implementation of the ATC process
2. Mechanisms and procedures for regular exchange of intra- and inter-sectoral information
3. Working groups for analysis, planning, coordination, etc.

Although agreements had been signed by the three ministries and ENTEL by the end of 1983, these did not produce the required interaction between the RCSP and the ministries' regional offices in San Martin. The central and regional levels of each sector were expected to coordinate not only local audioconferencing programming, but also intra-regional programming between Lima and San Martin. That interaction seemed necessary for coordination between Lima and the rural areas. The RCSP project assumed, for its part, the role of promoter in San Martin in the face of the difficulties of integrating the different levels within the same sector. For central headquarters to work with regional headquarters, it was necessary to change priorities and strategies.

With the support of the three sectors represented by the Educational Area of Tarpoto, San Martin's Health Region, and the Research and Agriculture Promotion Center of San Martin, project activity was coordinated in each locality. There were 24 staff persons in the area, three for each site. Responsibilities for the coordination of RCSP project activities were added to their routine tasks. Since then, the staff of coordinators has been a key element in the pilot program and in achieving project goals.

Some basic functions of the coordinators were:

1. To promote communications priorities
2. To establish a minimum number of ATC applications for their sector
3. To organize their audiences according to the programming
4. To notify the ENTEL coordinator of their requirements for using the system
5. To inform ENTEL and the sector of any changes in the programming
6. To coordinate the delivery of support materials for ATCs
7. To follow up the participation of their colleagues
8. To promote participation in their group during the sessions

Because each sector had the opportunity to appoint its own representatives as coordinators, a great amount of confidence was generated in the usefulness of exchanges of

information for the promotion of joint activities. The criteria each sector used for selecting its representatives were leadership ability, empathy, and knowledge of the communications problems of the sector. The establishment of a regular system of coordination between each sector and ENTEL became the basis of important successes and is probably the most solid element in terms of the future institutionalization of the system.

### Audiences

In keeping with the main goals of the RCSP, the ATC system should provide better coordination of programs, training, more efficient administration and information dissemination, and supervision of work in the communities. After the initiation of the project, however, some questions emerged concerning who would be the real users and/or beneficiaries of the system: the sector workers or community workers. It became evident that the most concrete strategy would be to encourage the sectors to use ATC for planning, information dissemination, research-related tasks, promotion, development of strategies, and supervision.

With this in mind, audiences were formed on the basis of specialization and administrative roles and responsibilities. Thus, doctors, nurses, elementary or high school teachers, sector specialists, managers, and planners constitute the system's audiences. The entire staffs of the central and peripheral offices were considered potential users of the ATC system during 1984, the first year of service. The next year the users expanded to include new groups, but they were for the most part related to agriculture, health, and education, particularly in the rural areas.

Despite the efforts of the applications planners, the formation of audiences could not be done from Lima, even though the government system usually operated from the center to the periphery. Lima and Tarapoto, however, functioned as programming centers of ATC and this raised the question whether the ATC system would duplicate the Peruvian development model which is typically centralized, bureaucratic, and traditional in its development efforts.

Even before the system became operative, contacts with potential users were made. Discussion and simulation sessions were held that identified a great range of communication needs and uses. A system was established for the selection of priorities in the use of the system in relation to the plans of each sector.

### Training of Groups for the Use of ATC

The general planning for social applications of ATC started in 1983. Intensive training was developed for coordinators, administrators, service professionals, technicians, and promoters from the three sectors by means of workshops using modular instruction. In the second half of 1983, six theoretical and practical workshops were held in Tarapoto, Juanjui, Saposoa, and Tocache. These workshops brought together 169 participants who were taught communications techniques and methodologies and how to use them in the planning, use, and evaluation of the system. The design of self-instructional material was emphasized. Another emphasis was self-sufficiency in planning, implementing, and evaluating their own applications of ATC.

During 1984 and 1985 the need to train new workers decreased. Another five workshops were held on more specific topics, such as pre-planning ATC sessions, techniques

for improving participation, improving presentation styles, and program feedback. Changes of personnel and their roles made it necessary to continue to provide adequate information about ATC and its potential through training workshops. RCSP's experience revealed that as more information on the techniques and methodology of using ATC is made available to potential users, more interest in participating is generated.

### Diagnosing the Needs of System Users

Because the ATC system was to respond to the needs of the three sectors, problems related to the management of health, education, and agricultural services were identified. It was also necessary to set priorities which would be addressed within the regular programming of the ATC service. Initially, none of the local groups had had the opportunity to present their priorities and were represented by the officials in Tarapoto. The result was a set of priorities that reflected the needs of Tarapoto rather than those of Juanjui, Saposoa, and Tocache. An important challenge, therefore, especially in 1984, was to promote the use of ATC and to address wider and more representative problems.

Diagnoses of problems and potential solutions were worked out with members of the RCSP team and planners and coordinators from INIPA, from the Health Area of San Martin and Juanjui, and from the Education Zone of Tarapoto. The results showed differences in the priorities of each locality which were not always in accordance with those of the regional officials in Tarapoto. This was a sensitive issue in the planning of applications. During the second year, however, the diagnosis of needs led to a greater representation of all the sites because of:

1. A change in program strategies and priorities which focused more on the peripheral areas
2. An analysis of needs and problems based on local conditions and staffing
3. A grouping of needs for the use of ATC according to themes which allowed a more organized and functional response from RCSP
4. The participation of some of the central ministries in determining needs and establishing a greater focus on specific local problems

The analysis of potential uses of the system also identified the need to support:

1. On-the-job training
2. Administrative activities, including personnel management, employee benefits, working conditions, payment of wages
3. Coordination of the implementation and follow-up of instructions, plans, and programs
4. Preparation of new education and agriculture plans and campaigns

### ATC Programming

During the training in the use of ATC and the diagnosis of needs, users presented one-hour sessions on ATC applications for long distance training. These sessions were also used as examples of types of applications as well, excluding only "one-time" emergency uses.

Sector needs determine the ATC schedule within a working day. ATCs in the evenings or at night were rejected for the simple reason that the system was to be integrated

as a new communications strategy within ongoing activities. In other words, it was to become part of the "daily work routine."

The necessity of preparing a monthly programming plan for ATC quickly emerged. This allowed schedules to be organized to meet the requirements of the three sectors, to coordinate speakers and lectures, and in general to control the programming. The result was a monthly schedule of ATCs, containing dates, hours, sectors, themes, coordination and transmission responsibilities, participating groups, and objectives. The monthly report prepared at the end of each month and distributed throughout the project area at the beginning of the next month contains the ATC activities planned in advance, activities that arose during the previous month, or those that were emergencies.

During the first year the programming and the monthly report were the responsibility of the ENTEL coordinator, and as a result programming went from Tarapoto to Juanjui, Saposoa, and Tocache. In the second year, as a result of the move of the planning and programming center to Lima, the monthly report was the responsibility of the RCSP's Office of International Affairs.

## DEVELOPMENT OF ATC PROGRAMMING

### Two Years of Applications

The audioteleconferencing program has become the most important activity related to health and agriculture in the Department of San Martin.

Between January and March 1984, the audioteleconferencing activities were exploratory and demonstrative in nature. This provided the opportunity for the users to gain experience in making presentations via ATCs and for the designers to observe the dynamics and behavior of the groups, coordinate the interaction, and determine the best organization of the system. It also provided an opportunity for the engineers to examine the equipment in action.

At first the program used only the teleconferencing rooms of the primary network (Juanjui, Saposoa, and Tocache) with programs coming from Tarapoto. The installation of the secondary network was completed in June of the same year. Direct access to channels and frequent use of the satellite were not available at first. The ENTEL procedure for accessing the satellite was very complex. The channels used for telephone service were shared by the ATC network, meaning that telephone service would have to be suspended when audioconferencing was in progress. At first it was necessary to make daily adjustments of the channels and have the hours of teleconferencing coincide with the suspension of the telephone service. In fact, telephone service was not suspended, and 90 percent of the initial audioconferencing was delayed because of the telephone traffic and because of adjustments of channels and the balance of the ATC system. The teleconferences were promotional and mostly administrative, and the duration of the sessions varied. Education used almost two hours per session; the health sector and INIPA used one hour. In most cases, neither agendas nor educational materials or other aids were used because they seldom arrived on time, and the sessions were usually long lectures without interaction between sender and receiver. The times of the conferences were not the most suitable, and as a result the attendance of participants was limited.

After the initial period, the three sectors were asked to formulate a program for the following months. Shortly thereafter, the installation work and the ATC secondary network trials resulted in the interruption of service, and strikes in the education and agriculture sectors temporarily prevented them from participating in the program.

During the second half of 1984, ATC activity attained satisfactory levels when the secondary sites were integrated into the system and the whole network began to work, albeit with technical problems related to imbalances in the system. During 1984, 425 teleconferences were registered, of which 85.4 percent were in the programmed category and the remainder in the non-programmed category; of these 425 teleconferences, 62.1 percent were executed and the remaining 37.9 percent were cancelled (see Table 1).

The cancellations were caused by technical and participant coordination problems. The problems with participant coordination caused 63.4 percent of the cancellations and technical problems caused 36.6 percent. "Participation" problems included absence of participants or lecturers, strikes, lack of coordination, changes in schedules, heavy rains, local holidays, etc. (see Table 2).

During 1984 the focus of the project was on the application of the telecommunications network to train and instruct staff of the health, education, and agriculture sectors rather than on administration and coordination (see Table 3).

**Table 1**  
**Number of Audioteleconferences, 1984-1985**

|                          | 1984       | 1985       | Total      | Percent       |
|--------------------------|------------|------------|------------|---------------|
| Total ATC                | <u>425</u> | <u>555</u> | <u>980</u> | <u>100.00</u> |
| Scheduled Transmissions  | 363        | 365        | 728        | 74.28         |
| Additional Transmissions | 62         | 190        | 252        | 25.72         |
| Completed ATC            | 264        | 398        | 662        | 67.55         |
| Cancelled ATC            | 161        | 157        | 318        | 32.45         |

**Table 2**  
**Audioteleconference Cancellations by Type of Problem, 1984-1985**

|                      | 1984      | 1985     | Total     | Percent      |
|----------------------|-----------|----------|-----------|--------------|
| Technical Problems   | 59        | 24       | 83        | 26.10        |
| Participant Absences | 11        | 15       | 26        | 8.18         |
| Lecturer Absences    | 20        | 62       | 82        | 25.79        |
| Labor Strikes        | 19        | 22       | 41        | 12.89        |
| Lack of Coordination | 12        | 26       | 38        | 11.95        |
| Other                | <u>40</u> | <u>8</u> | <u>48</u> | <u>15.09</u> |
| TOTAL                | 161       | 157      | 318       | 100.00       |

**Table 3**  
**Completed Audioteleconferences by Activity, 1984-1985**

|                     | 1984               | 1985              | Total             |
|---------------------|--------------------|-------------------|-------------------|
| In-Service Training | 134 (50.76%)       | 235 (59.05%)      | 369 (55.74%)      |
| Administration      | 44 (16.67%)        | 37 (9.30%)        | 81 (12.24%)       |
| Coordination        | 52 (19.70%)        | 105 (26.38%)      | 157 (23.71%)      |
| Promotion           | <u>34 (12.87%)</u> | <u>21 (5.27%)</u> | <u>55 (8.31%)</u> |
| TOTAL               | 264 (100.00%)      | 398 (100.00%)     | 662 (100.00%)     |

The enthusiasm of the participants, technical delays, lack of previous experience in interactive communication, lack of experience as communicators, and start-up problems led to excesses in the use of the ATC channel and sessions which went beyond the scheduled 60 minutes. In the first six months, the average session lasted 70 minutes; in the second six months, it diminished to 54 minutes as a result of more rigorous discipline and control of the program.

The education sector completed more audioconferences (221) than any other sector--amounting to 33.4 percent of all audioconferences completed in 1984-85. The cancellation rate of the education sector, however, was higher than any other sector--36.3 percent. Agriculture had the highest completion rate (73.6 percent) but also held fewer audioconferences (89) than any other sector in that time period (see Tables 4 and 5).

**Table 4**  
**Number of Audioteleconferences by Sector, 1984-1985**

|               | Agriculture |      | Education |      | Health |      | ENTEL-Peru |      | Total |
|---------------|-------------|------|-----------|------|--------|------|------------|------|-------|
|               | 1984        | 1985 | 1984      | 1985 | 1984   | 1985 | 1984       | 1985 |       |
| Total ATC*    | 46          | 75   | 145       | 202  | 167    | 114  | 67         | 164  | 980   |
| Completed ATC | 32          | 57   | 106       | 115  | 101    | 88   | 25         | 138  | 662   |
| Cancelled ATC | 14          | 18   | 39        | 87   | 66     | 26   | 42         | 26   | 318   |
| Delayed ATC   | 22          | 35   | 45        | 70   | 61     | 56   | 16         | 55   | 360   |

\* Scheduled and unscheduled

**Table 5**  
**Number and Percentages of Scheduled Audioconferences Completed and Cancelled By Sector, 1984-1985**

| Sector      | Total Scheduled | Total Completed | Total Cancelled | Percent Completed | Percent Cancelled |
|-------------|-----------------|-----------------|-----------------|-------------------|-------------------|
| Education   | 347             | 221             | 126             | 63.7              | 36.3              |
| Health      | 281             | 189             | 92              | 67.3              | 32.7              |
| ENTEL       | 231             | 163             | 68              | 70.6              | 29.4              |
| Agriculture | 121             | 89              | 32              | 73.6              | 26.4              |
| TOTAL       | 980             | 662             | 318             | 67.6*             | 32.4*             |

\* Average

At the end of that first year, even taking into account the difficulties of planning and operating a project in a rural area, the participant evaluations showed that the frequency and quality of the contacts and exchanges of information among the different administrative and operational levels in each sector noticeably increased. The planning process of local development programs involving health, education, and agriculture was facilitated because of the ATC role in the decision-making process. The traditional, centralized planning model of the three sectors gradually changed to include presentations of problems of local development and administration in the peripheral areas (Juanjui, Saposoa, Tocache, and the secondary sites). The presence of ATCs generated participative planning and decision-making among staff ranging from the center to the field.

In view of a greater demand for use of the system, the RCSP carried out a needs survey in each locality, including Tarapoto. This information was fed into the planning process in Lima, and local, regional, and national needs were more equitably represented in the programs. Consequently, the team in Lima assumed responsibility for program coordination and the structuring and distribution of the monthly ATC report throughout the zone.

The ATC transmission center was moved to Lima and, as a consequence, new groups of participants in Lima became lecturers. Among the new participants were the Medical School, Nursery Education School, Veterinary School, Hospital del Niño, the Agricultural Extension Division, and special, primary, secondary, and higher education administrations. The secondary network was not included in the program because of already known technical problems, and it began to be dismantled by the end of the year by order of the director of the project at ENTEL.

As a result of a change in the central Government of Peru, changes occurred in the direction and nature of development programs. At the same time, several changes of project headquarters and coordination office personnel obliged the project to present and promote its objectives anew in order to continue the program.

In 1984 there was also an improvement in the technical quality of the system due to a reduction in the number of dedicated channels and the relocation of the ATC bridge from Tarapoto to Lurin. This helped to increase the effectiveness of the program and to better meet the needs of the users.

As part of its effort to institutionalize the ATC system, ENTEL intended to transfer the control of the ATC facility to its Commercial Management Office. An ensuing controversy between the Commercial Office and the International Affairs Office over control of the ATC system posed obstacles to the successful advancement of project objectives.

From 1984 to 1985 the number of teleconferencing sessions, scheduled and unscheduled, increased by 130 to a total of 555. The percentage of ATCs actually completed also increased from 62 percent to almost 72 percent in 1985. Cancellations from technical problems decreased markedly from 59 in 1984 to only 24 in 1985 (see Table 2). Unfortunately, cancellations from a lack of participation (i.e., labor strikes, participant and lecturer absences, coordination problems) markedly increased. Participation problems caused over 63 percent of the cancellations in 1984 but almost 85 percent of the cancellations in 1985. Whereas technical problems were the leading cause of cancellations in 1984, lecturer absences became the leading cause in 1985.

The use of the teleconferencing facility in Lima doubled when it became the major organizer of the ATC sessions, and in general the sessions were better organized and developed due to more effective coordination. System use and time was more disciplined, and sessions were better prepared by the coordinators and lecturers. Time for lectures, dialogues, and roundtable discussion was better allocated, and thus made better use of instructional materials and agendas. Despite a few drawbacks, the program was directed in a proper and aggressive manner from Lima.

In 1984 and 1985, a total of 980 ATC sessions were planned and/or requested. Sixty-eight percent of those sessions actually took place, and 32 percent were cancelled. The predominant application in both those years was in-service training. Lima and Tarapoto shared responsibility as originators of programming. The education sector was the most intensive user in terms of number of ATCs requested and run. The health sector was second; however, the agriculture sector and ENTEL had the best records for completing requested sessions (see Table 5).

### **Efforts at Greater Impact**

It was decided to combine audioteleconferencing with videotape to have a greater impact on training. This was started at the beginning of 1984. The natural sciences specialist in education in Tarapoto perceived the ATC as a training alternative for teachers without academic degrees and as an upgrading opportunity for teachers with academic degrees in the natural sciences. Through the organization of a program called "Science Within Reach of Everybody," four ATCs were conducted in July and October.

The program included the production of a videotape of a model class studying a specific topic in the natural sciences. The videotape was transmitted through the commercial TV channel in the project area which reaches some of the RCSP participating localities such as Juanjui and Tarapoto. Tocache and Saposoa were sent the tapes to be shown on a VCR.

A formative evaluation chart was completed by teachers after watching the video. ATC was used for evaluating the TV program in terms of its content and technical aspects as well as its potential for teacher training. During the ATC doubts and questions of participating teachers were also raised.

The program was planned to be broadcast twice a week, but it was actually broadcast four times during four weeks and four ATCs were held. This was an interesting and good idea, but it had some constraints such as the lack of a regular TV signal in Saposoa and Tocache which hindered their synchronized participation. The limited resources of the local education sector did not allow a copy of the video to be sent on time so that the teachers in those locations could watch it on a VCR before the ATC was held. There were also technical problems in the ATC network, and the absence of the secondary network did not allow this system to be used as a continuous, useful, and effective means for all the natural science teachers in the region. The attitudes of the personnel in charge of the broadcasting and coordination in the local education zone were negative because of breaches in the agreements and because no one took responsibility for some aspects of the work. However, it certainly is an interesting concept which might be very effective if all necessary elements are considered during planning, such as the extent of TV coverage, available local resources, and the technical reliability of the ATC system.

### Long Distance Medical Consultations

Because health personnel in the secondary network included very few qualified professionals and staff, and the area hospital at Juanjui could not assume supervision responsibility, the ATC had the potential to become an important link with health personnel to provide long distance support for the treatment, supervision, and follow-up of cases at the peripheral posts.

Initially, Bellavista and Tingo de Saposoa were scheduled to participate on Mondays and Huicungo and Pachiza on Fridays. But later it was noted that Tingo de Saposoa had few patients; and then Bellavista withdrew from the consultations because it had its own physicians. To avoid ATC cancellations resulting from the absence of participants, the three localities were scheduled to participate on Mondays and Fridays.

Long distance medical consultations were held from June to November 1984, and 14 ATCs were conducted. There was a large number of cancellations caused by technical problems with the bridge linking Juanjui's earth station with the secondary network as well as the deficient performance of the VHF equipment.

The ATCs were coordinated from Juanjui. On the scheduled date and hour, a doctor of Juanjui's hospital went to the ATC room and provided medical advice regarding the treatment of specific patients to the health technician at the distant health post. The health technician described the symptoms of the patient. The physician then made comments or asked questions to elicit information. Patients briefly described their clinical history and the symptoms that brought them to the health post. The doctor then gave instructions for treatment to the health technician, and, if warranted, requested that the patient transfer to Juanjui.

This system was very effective within the community and the health sector because it allowed patients in remote areas to have access to medical consultation free of charge. The patient saved time and avoided the inconveniences of traveling a long distance. The consultation between the technician and the professional was equally as advantageous for the technician. Unfortunately, this could not be continued because of technical problems that hindered the program.

Some of the lessons learned during the development of medical consultations were that the ATC facilities where patients described their symptoms should provide privacy so the patients can feel comfortable. Their illnesses and symptoms are very personal and should be shared only in strictest privacy. The health technicians should have a number of basic drugs to allow them to give the treatments recommended by the physician. The doctor that gives professional support should have the ability to transmit concern and warmth through his or her voice in such a way that the patient is encouraged to talk openly and confidently about his symptoms and the doctor's instructions.

Although medical consultations were carried out between Juanjui and the secondary posts, this could also be done among and between Juanjui, Saposoa, Tocache, and Lima. This is especially important for the first three localities because they do not have specialists in all the fields of medicine. Unfortunately, local doctors and health professionals did not have the time and academic training for elaborating case reports.

## **Administrative Support and Long Distance Training by ENTEL**

ATCs held by ENTEL for social and technical coordination at the beginning of RCSP revealed the potential of the network for ENTEL's internal needs. It was only much later, however, that ENTEL came to be a major and effective user of the network. In May 1985, ten ATCs on human relations were organized for project and Iquitos personnel through the training office of ENTEL. Although the training aspect of the program was deficient, it had a widespread effect because the ATC users in the field perceived that the system was a far-reaching and feasible means of training. The RCSP team made arrangements with ENTEL's management offices for the development of training programs.

In terms of network hours in 1985, ENTEL used more time than any other sector, not only because it had access to the technical infrastructure but also because it was the best organized of the various user groups. Through the ATC, local administrative offices had greater access to the different levels within ENTEL.

ENTEL's use of the system for operational, administrative, and technical purposes expanded efforts to coordinate project activities between the field and Lima. ENTEL ATC services became a training and communications alternative and a consistent and quick means to alert the administrative offices (at Tarapoto, Iquitos, and Lima) of problems. The traditional face-to-face training program was very expensive. The potential of ATC for reducing training costs was also perceived by ENTEL, and it also realized the need to exploit the system because it had paid for the use of ATC's exclusive channels.

It is worth emphasizing ENTEL's effort to use ATC in a variety of ways and to provide the participating personnel in all locations with materials, booklets, and agendas. Even though materials arrived late, it was demonstrated in some cases that success could be achieved with improved logistical support.

## **Long Distance Teachers Training: ATC and Broadcasting**

From early 1985 the RCSP designers attempted to organize special education programs at the request of teachers in that discipline. This could not be done until April 1985, because the Ministry of Education's Director of Special Education did not understand the importance of the ATC system. Moreover, the promotion of specific initiatives for a single area of the country can generate administrative problems for the Ministry.

In April 1985 the Director of Special Education in Lima visited Tarapoto for the first time and inspected the system, noting its potential for long distance training. In coordination with the Director of the Centro de Diagnostico del Nino Excepcional (Handicapped Children Diagnosis Center), the Hogar Clinica San Juan de Dios, and the Special Education Directorate, training programs were arranged.

Teleconferencing for this program began in July 1985 and ended in December. There were 37 ATCs. Topics included detection of the handicapped child, elaboration and evaluation of admissions tests, occupational education for the handicapped, early stimulation, and the management of infant handicaps. The results of the special education ATCs were analyzed in Lima, and the most important conclusion was the decision to create a special education center in Juanjui to teach those who had handicaps.

The impact of these 37 ATCs among users and the local communities was widespread. For the first time there was an opportunity to go outside the community for

support and advice regarding handicapped children. First, the Parents Associations were invited to the ATC sessions to ask questions. Then announcements were broadcast through the local radio by the Coordinator of Applications at Tarapoto. Later, interviews were held with officials on the radio. Radio San Martin offered free time. From November to December 1985, four sessions following this strategy were conducted and were effective. The public was encouraged to make telephone calls during the ATCs, to attend the ATC sessions, to send letters with questions, or to contact the system through other means. A few people attended the sessions and a few more telephoned during the ATCs to ask questions. It was readily determined that the strategy of using the radio to extend the benefits of the ATC was advantageous, particularly since the people of these localities listen to the radio. Some technical problems appeared during this exercise. But one experience was successful. Students at the Instituto Superior Pedagogico de Tarapoto (Tarapoto Pedagogical Institute) organized a radio audience forum around a transistor radio and afterward the participants attended a session to ask questions.

In Juanjui the experience of dealing with the problems of handicapped people promoted a study of the scope of the problems of the handicapped. Likewise, arrangements were made with the Audition and Language Center and the Special Education Directorate to obtain support for the endowment of a treatment and rehabilitation center for handicapped children.

### **Agriculture Extension through ATC**

During the first year that audioteleconferencing was used by the agriculture sector, a series of unexpected problems occurred. These problems led to a whole new approach the second year with fairly satisfactory results.

The problems were related to the methodology that the agricultural agents use to promote and develop crops. The training visit method is based on direct contact between agricultural specialists and farmers and the assumption that they have enough training and technological knowledge to transmit information to the farmers. In 1984 the INIPA had problems with training extension specialists because of a lack of resources. At that point the ATC system was not regarded as a training and extension alternative or as a substitute for travel of the specialists to the training localities. In addition, the dates and hours scheduled for the agriculture ATCs (Tuesdays and Thursdays at 10:00 a.m.) were incompatible with the training visit programs because if the extension workers attended the ATC, they could not go to the countryside to work with the farmers.

Other problems were the lack of leadership of the coordinator of INIPA activities in Tarapoto and labor unrest. The coordinator was unable to provide cohesive management or to explain the problems of scheduling and selection of lecturers. This was reflected in the poor quality of the contents of the audioconferences and the lack of responsibility of the lecturers who did not prepare their lectures or simply did not attend the sessions. All this resulted in a total lack of motivation among the audience and almost caused the program to fail during the first year.

In late 1984 formative evaluation meetings were organized. In these meetings all of the agriculture sector users said that the above problems were the reasons for their lack of participation. The results of these meetings were changes in the program as follows:

1. The sector coordinator in Tarapoto was replaced by a more dynamic and interested person.

2. The ATC Emission Center was moved from Tarapoto to Lima to facilitate the participation of the central offices of the participating ministries.
3. The programs were developed according to the training requirements of the users.
4. A new time, Fridays at 11:00 a.m., was set for the teleconferences which did not interfere with the training visit activities in the countryside.

To meet the training requirements, close coordination was established with INIPA's representative in Lima. He was informed about the schedules arranged by the agriculture sector users in the field. Coordination was also established with other specialists of INIPA and with agricultural research centers, such as the Artificial Insemination Center and the Universidad Agraria de La Molina. Changes in administrative personnel in the Office of the Research, Promotion and Extension Directorate also provided a very good opportunity to reinterpret the role of the agriculture sector as an ATC user.

All the efforts had the expected impact, and the users of the ATC service relied on the system again. Although this success resulted from team work, the role of INIPA's coordinator in Lima was of great importance. In 1985 he began with a set of eight ATCs on extension methods. His participation was fundamental because being both coordinator and lecturer, he had the ideal qualifications for an ATC lecturer/long distance trainer. He prepared clear, didactic, and simple materials that were distributed in the field ahead of time. He had the ability to successfully relay lecture content because of his lively and warm presentation style which motivated audience participation, and his theoretical lectures were adequately complemented with practical examples.

### Continuing Long Distance Medical Training

By the end of 1984 and the beginning of 1985, something important happened in the health sector. Health sector professionals in the project area requested speakers from Lima, arguing that training ATCs from Tarapoto were not professional enough to provide good medical support. In fact, Tarapoto does not have medical specialization centers, and there is a shortage of highly specialized professionals. There was a strong effort to provide the necessary support from Lima.

First, the participation of the Ministry of Health through the Department of Health Education was considered, and an attempt was made to organize audioteleconferences. This failed because many ATCs of the previous year were repeated and the zone requested the cancellation of the programming. It was then that coordinators of the RCSP in Lima became aware of how difficult it is to work with the ministry. The immediate alternative was to look for professional institutions in the field of health care that would assume responsibility and at the same time would meet the training requirements of the users. A doctor who had just begun working with the project in Tarapoto contacted the Peruvian Medical School suggesting that it assume the responsibility of training and placing physicians in the Central Huallaga region. The program developed was presented to the Peruvian Medical School representatives for approval. The school accepted the responsibility through its already functioning program of physician visits to departmental capitals throughout Peru.

The training needs covered a great range of specialties and themes. For 1985, annual programming was organized in four blocks:

- Internal Medicine: April and May
- Pediatrics: June and July
- Obstetrics/Gynecology: August and September
- Primary Health Care: October, November, and December

The ATCs were programmed on Thursdays at 12:00 noon with a total of 31 ATCs for the year. It had a great impact on the medical staff attending the ATCs, for almost none of them had had any training since arriving in Huallaga. At the same time, however, there was some degree of dissatisfaction among technical and auxiliary personnel who participated because of the highly technical language which did not allow them to completely understand the presentations.

The number of physicians assisting in the session was not optimal because of several factors, including the amount of time they spend attending patients. Instructional material was prepared to support the ATCs; however, problems arose with the development of the materials and its delivery and distribution, and delays could not be avoided.

For the Peruvian Medical School, this experience was valuable because it now had a communications method around which to develop a program of Long Distance Continuing Education which it had been doing by sending specialists to different parts of Peru. This required great resources and provided limited coverage, compared with the significant savings and the wider coverage offered by ATC. The program offered by the Peruvian Medical School was one of the best series of ATCs ever offered over the network.

### Long Distance Training for Primary Level Language Teachers

During the coordination meetings with personnel from the educational sector in Lima in early 1983, the Instituto Nacional de Investigación y Desarrollo de la Educación (National Institute of Research and Educational Development--INIDE) was invited to become a user of the system. During this time, INIDE developed the PROMULCAD Project, a multinational project (Chile, Peru, Panama, and Venezuela) aimed at identifying alternative strategies for in-service training of teachers. The RCSP and the Coordinating Office of PROMULCAD established the basis for the development of a distance, teacher training program through ATC which was coordinated with the Education Zone of Tarapoto and the Provincial Supervisors of Juanjui, Saposoa, and Tocache. The proposed program produced an immediate and positive response.

ATCs were used for language training for first and second grade teachers and for the supervision of specialized instructional programs for the fourth grade. ATCs were also used to help in the study of local cultural patterns associated with teaching and learning methods. ATC sessions dealt with the design of culturally appropriate texts for use in such areas as the Peruvian jungle. PROMULCAD also sponsored a cost study of the benefit of using ATC compared with other methods of distance training.

During March and April 1984 participating teachers were selected by PROMULCAD in coordination with Tarapoto's Education Zone. Admission tests were immediately administered to measure the academic preparation and experience of teachers and to identify their deficiencies. A language specialist conducted training from PROMULCAD in Lima. Traditional teaching methods within the RCSP zone were analyzed by each participant, and the results were presented through ATC.

The improved strategy of teaching and long distance supervision from Tarapoto strengthened teachers' skills in the use of instructional materials. Modern teaching methods and information regarding problems and experiences in the teaching and learning process with individual or group teaching were analyzed through ATC. New teaching materials were designed and their use was supervised.

Since May 1984, there have been many interruptions in the program caused by technical problems and strikes in the education sector. The first sessions had a great effect among teachers. In the RCSP zone, most teachers do not have professional degrees but can take courses only during the summer holidays from January to March. To have an alternative method of training at no cost with high-level specialists is of great assistance to teachers eager to acquire new skills in language teaching for the early grades.

At first the expectations of the teachers were too high in relation to the quality and number of skills to be acquired. In addition, initial objectives stated by PROMULCAD concerning the use of ATC as an alternative for teacher training were too ambitious considering the available resources, the capacity to respond to the teachers' expectations, and the capacity for supervision and control of follow-up.

An effort to revive participant interest and to supervise the achievements and problems at each site led the coordinators of PROMULCAD to visit the entire zone of the rural communications system. Personal contact restored participant interest. However, it was noted that teachers did not read or assimilate the instructional and lecture materials when they were delivered. They did not have a system for team work or disciplined study habits. For many teachers without professional backgrounds, teaching was an occupation just as any other. Teachers expected to be taught in concrete terms and not to be given general concepts which were difficult for them to understand because of poor preparation.

When the ATC sessions began again, PROMULCAD was in a difficult administrative and economic situation. The specialist in language ended her contract, and it was not renewed. Thus, the program was suspended without having been completed.

These few training sessions demonstrated the potential of ATC as an alternative for long distance training. ATC has its limitations, however, and it is necessary to consider its usefulness within a set of alternative strategies. For example, ATC training sessions must be part of programs that offer complementary face-to-face training, supervision, and supporting printed materials.

The particular character of the geographic area also must be considered when planning training alternatives. Program experience also led to the development of better relationships among parts of the same system (i.e., the education zone and PROMULCAD) with each taking explicit responsibilities and functions.

### **Coordination of a National Vaccination Campaign, "VAN 85"**

The Department Coordinator of the nationwide 1985 National Vaccination Campaign for Children requested ENTEL's support and the use of the ATC system in the campaign. In meetings, particularly in Tarapoto and Juanjui, ENTEL formally offered the use of the ATC system for the campaign. The coordinator of the campaign used the system for conveying travel schedules to the various parts of the department, for presenting the strategies of the campaign, and as a means of motivating staff and organizing the work to be done including logistical support.

During the campaign, the system was used to gather information on coverage and effectiveness as well as on problems and the development of alternatives. When the campaign ended, the ATC system was used for analyzing the efficacy of the activity in the face of existing problems, the objectives attained, the use of ATC as a means of sharing experiences, and gathering and analyzing statistics regarding campaign progress.

### Styles of ATC Presentation

Among the methods and technologies adapted for audioteleconferencing, the best are those allowing long distance interaction. Presentations must be clear and simple. Experience shows that the ATCs combined with lectures and dialogues among participants are the most effective.

During the RCSP user training, simple and basic guidelines were given to users for each session. These guidelines emphasized the initial "humanizing" process by means of greetings and introductions among the participants in all the rooms, instructions for lecturers in handling the printed materials, instructions for question and answer sessions, summaries and homework assignments for the next session, and methods of closing the session. The guidelines were flexible and could be adapted to different applications. The time devoted to each phase should be fixed, taking into account that a great part of the session must be devoted to interaction with the participants.

During the first year, the sessions were characterized by long and tedious lectures without any participation through questions and answers. Later the users had more varied and flexible styles of presentation learned from experience, and they became aware that audience participation improved the quality of the training. Sessions with the intervention of tutors, monitors, and lecturers at the same time got more attention and generated more participation. In some instances, ENTEL and the health sector incorporated a variety of techniques with questions addressed to specific participants, stimulating presentations of typical cases for discussion among all participants. In those sessions it could be observed that the interactivity among participants increased noticeably.

ATC presentations require a strategic handling of participant stimulation. Long distance presentations will always be challenging. Thus, the quality and success of an ATC should be measured not in terms of excellence of presentation, but rather in terms of its capacity for stimulating discussion and interaction of participants to reach a goal, be it an agreement or the opportunity to carry out an idea or develop a strategy.

### Use of Instructional Materials

Because audioteleconferencing does not transmit images to participants, they must be provided with agendas, posters, or other auxiliary materials. Participants must have printed instructional materials to support self-learning before, during, and after an ATC session. The instructional material becomes in this way the most important element for the student because it is more tangible than the presentation of a concept through the ATC. ATC is only the initial vehicle of the long distance training process.

At the beginning of the program, many materials were used, but their form and content were not designed to stimulate self-learning. The training did not take into consideration, in most cases, the need to immerse the participants gradually into a

process of acquiring knowledge and gaining experience. The support materials were mostly summaries or the complete contents of lectures.

In August 1983 and April 1986 the RCSP held workshops on the design and use of instructional materials for use with ATCs. Forty people from the three sectors in Tarapoto attended the workshops. The problems these groups faced explain to a great extent why instructional materials were not used. There was no budget in Tarapoto and Lima for printed materials. The people being trained did not receive the support of their sectors in the production of the materials. The shift of ATC planning and transmission from Tarapoto to Lima at the beginning of 1985 also left behind personnel with materials development ability and experience.

### Interactivity among Audiences

In the RCSP the interactivity among audiences must be seen two ways: as a spontaneous activity of the participants or as an activity directed by or generated by lecturers or monitors from the transmission room.

Little spontaneity was observed. Generally, the audience was passive. In reality the inhabitants of the Peruvian jungle are very communicative. Nevertheless, in this case, among participants of the same sector but from different levels in the hierarchy, interaction was automatic and traditional. Many participants did not express their ideas or share experiences fearing to show faults in their work which could create problems for them. Others passively accepted messages because they were given by their superiors or bosses. This was characteristic of most ATCs of an administrative, coordinating, or supervisory nature.

The interactivity occurred only with specific questions from the transmission room to specific participants or open questions addressed to any of them:

"What does Pablo Fasanando in Tocache have to say about the subject ..."

"What does Marcial de Aguila in Saposoa think about what Pablo said in Tocache ..."

"Jose Panduro in Tarapoto, could you briefly tell us what were the results of the introduction of the 'Tropical 28' corn variety in regard to the quality of the grain and its adaptation to the climate?"

Sometimes, many of the participants said that they did not pose any questions or make any comments because their questions were answered when the problems of their colleagues in other places were solved.

## **USER ATTITUDES REGARDING THE RCSP AND AUDIOCONFERENCING**

During the development of the ATC program, many of the participants expressed their opinions in interviews held as a part of the follow-up process and formative evaluation. Initially, the administrators within the sectors, as well as the users, were aware that they had a rapid communications system. Although there were several initial technical problems in the transmission network, the certainty that they could be resolved ensured interest and, moreover, enhanced the concept of an interactive communications system.

Even though it was difficult to measure the benefits of the project, not only in terms of saving money but also in terms of supporting sector goals, the RCSP introduced a new method of integrating local needs into a comprehensive plan, of providing a means of representative and flexible decision-making, and of extending the supervision and control of programs and services.

When compared with other regions in Peru, the advantages of San Martin, because of its communications system for development, were noted from the beginning by administrators in the three ministries in Lima and were also perceived by many users. That is why the attitude of the users remained enthusiastic and persistent despite continuous problems. For many people, the presence of the system and its utilization provided the first opportunity to interact with colleagues and supervisors and to discuss common problems and strategies. It also provided training and information-sharing opportunities which were not feasible in the past because of limited resources.

There were also arguments against the program, such as the huge costs of the satellite communications network for a rural area, particularly if the project had to pay for all the costs. The program was also criticized on the basis of its sophisticated interaction techniques in the face of traditional customs and abilities. The lack of flexibility of the system in reaching people, particularly during non-work hours. The RCSP was criticized because the users had to attend the sessions during their work time. Finally, the program was criticized for its limited coverage because RCSP programs generally reached only small groups at each site.

In the end, the presence of a rural communications system gave many people a new way to address the structural constraints of rural development and an opportunity to achieve goals at a lower cost. From here on, the future of the program will depend on ENTEL's ability to apply the experience and adapt the system to meet the demand for communications services and to extend its use to other groups. This will be the challenge for institutionalizing a service that has demonstrated its validity and capacity to adapt itself to the needs of specific groups.

## **A MODEL FOR DEVELOPMENT THROUGH AUDIOTELECONFERENCING**

During the course of the RCSP, many lessons were learned. One major question regarding interactive communications systems was whether they can provide strong support for development activities in rural areas. Stated in a more global way, "Can rural communications services for development be improved and provide greater benefits for the client population and improve socio-economic conditions?" What must one do to adapt the system to the structural needs of development rather than to those of individuals? This section is an attempt to examine the steps taken by the RCSP and discover if they can lead to an ideal structure or model from which better results could be expected in terms of organization, program dynamics, and achieving development goals.

### **Diagnosis of Needs**

The diagnosis of communications needs should start with knowledge about the sectors to be served, including their organization, functioning system, decision-making structure, and channels of command. Diagnosis should include knowledge of the programs, priorities, possible strategies, available resources, communications requirements, and use of the services. The diagnosis of needs and problems is the most important aspect of all the activities. The diagnosis should result in a systematic analysis of problems and provide a set of themes around which to plan a program.

### **Selection of the Project's Field of Action**

In social communications projects, public development institutions and their staffs are often key participants, and it will be necessary in program development to include health, education, and agriculture agencies and their representatives in the field--health center staff, educational supervisors, or extension workers. The next group to consider are those with experience and skills in mounting and operating different components of satellite communications systems including land and other links. This is particularly important for pilot projects in which the equipment must operate under extreme environmental conditions. A careful and planned process of technology transfer should be developed throughout the project, but particularly in the initial stage of implementation.

An efficient supply system must be set up for equipment and spare parts, and the local administrative unit should be included in the decision-making process. An auxiliary group of technicians to work not only in one place but also throughout the area of activity would be ideal. Excessive centralization of human resources, technology, and decision-making reduces efficiency and flexibility, especially in the case of rural communications services. Having the RCSP project's main office in Lima and not in Tarapoto meant that concerns in the field regarding budget and other problems were not immediately addressed, causing delays and inefficient use of the ATC system.

### **Project Field Offices**

Establishment of a project field office responds not only to the need for "representation" in the area but also provides an executing agency and a mechanism for coordinating the different components of the program and inter-institutional activities, as well

as the program's expansion in qualitative and experimental terms. Local field offices are also more able to respond to local problems as they arise.

### **Operation Agreements**

Formal agreements among various institutions and individuals clarify responsibilities, roles, and access to resources. Such agreements are essential for rural development communications projects. The experience with agreements in the RCSP indicates that they should be precise, spelling out responsibilities and roles of all parties in planning, executing, and supervising activities at all levels. Agreements should specify the resources (goods, infrastructure, budget, and staff) that each sector will contribute to the project. Finally, the agreement must be representative of the sector at the central, regional, and local level. The particular conditions under which the public sector works require concurrent action at least at the central and regional levels.

### **Basic Coordination**

A project like the RCSP, based on operation agreements in the public sector, requires commitments of its participant organizations and must respond to project needs in a joint and organized way. To do this, there must be full-time coordinators devoted exclusively to the development of the project. Merely sharing activities or assigning functions to other segments of the project does not yield good results. This coordination must occur throughout the whole project, investigating needs, providing information about the benefits of the project and the use of the system, organizing audiences, motivating participation and interaction during transmission, and following up the process to see what works and what does not and why.

### **Organization of Audiences**

Specific audiences have commonalities in terms of their communication, information, training, and coordination needs. The homogeneity of each audience in terms of identification with the same problem, level of education, experience, place in the administrative hierarchy, and responsibilities should not only lead to the solution of problems and addressing of needs but also should simplify the planning sessions.

### **Training in the Use of the System**

Training must be considered a process and not a single activity at the beginning of an ATC project. It is one of the elements that the promoters and coordinators of the project must count on. Periodic training sessions allow continuous feedback on the process of using communications systems and also contribute to evaluation. Ongoing training must be aimed at satisfying information requirements, especially in the case of new personnel and personnel rotations. The training workshops during the development stage of a program should focus on the techniques and methods of planning, presentation, and so forth.

### **Design of ATC Programming**

ATC programming should be well organized if it is to address important communications needs. The most effective programs are planned well in advance. Themes for the presentations and a list of speakers and moderators should be compiled. Program times should be chosen on the basis of the best time for the users. Instructional materials should be distributed to the ATC sites before the sessions. Someone should be in charge of coordinating each of the sessions.

### **Design of Formative and Summative Evaluation Plan**

From the earliest planning stages there must be a system of interchange of local, regional, and central information aimed at making the coordination easier between the different levels and among participating groups. The interchange should be initiated within each user sector and then expanded to reach all of the participating groups. A system for follow-up activities and strategies should be developed that provides information on the qualitative and quantitative results of the use of the communications.

The formative and summative evaluation activities are complementary, the first focusing on the process and the second on the direct impact of programs. These two kinds of evaluations require the establishment of information-gathering systems for both qualitative and quantitative information. Such data would include a record of every ATC activity--programmed and non-programmed. Survey instruments should be developed and open interviews held with participants. Information should be submitted monthly for assessing the program's progress and making adjustments.

General conclusions to be drawn from the Peru Rural Communications Services Project are that communications for development should be based on several means rather than on one such as ATC. Development strategies for communications programs should emphasize organization and coordination based on an exchange of information at every level of each participating institution. It is imperative that the relationships among the various parts be flexible. The flexibility of the plan must be based, on one hand, on the specific structural problems of the program and, on the other, on the requirements of the user groups.

## AID RURAL SATELLITE PROGRAM PUBLICATIONS

This report is one of a monograph series, "Telecommunications and Rural Development," prepared for the AID Rural Satellite Program by the Academy for Educational Development, including:

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