

PN 7117-695

51089

**INSTITUTIONALIZATION OF
THREE TELECOMMUNICATIONS DEVELOPMENT PROJECTS**

Prepared by:
Michael A. Calvano, Ph.D.

AGENCY FOR INTERNATIONAL DEVELOPMENT
Bureau for Science and Technology
Office of Education

Dr. Clifford Block
Project Manager

A Publication of the AID Rural Satellite Program
Produced by **THE ACADEMY FOR EDUCATIONAL DEVELOPMENT** under
Contract No. AID/DSPE-C-0081
January 1987

CONTENTS

INTRODUCTION	1
Rural Satellite Program	1
RSP Project in Indonesia	2
RSP Project in Peru	3
RSP Project in the West Indies	4
INSTITUTIONAL DEVELOPMENT: A CONCEPTUAL DESCRIPTION	6
Institutions, Organizations, and Institutional Development	6
Internal Organizational Elements	7
Institutional Linkages	8
The Process of Institutional Development	8
ANALYSIS OF THE INSTITUTIONALIZATION OF THE THREE RSP PROJECTS	11
Analysis of Institutional Configurations	12
Leadership	13
Resources	14
Internal Structure	15
Conclusions	16
RECOMMENDATIONS FOR FUTURE PROJECTS	17
REFERENCES	18
AID RURAL SATELLITE PROGRAM PUBLICATIONS	19
ACKNOWLEDGEMENTS	20

INTRODUCTION

The institutionalization of international development projects has been the concern of development specialists for many years. The new ideas, skills, technologies, management systems, work styles, and other innovations which are the basis for all international development activities are shelved and forgotten soon after the project terminates, if these innovations are not properly integrated into existing social and organizational infrastructures. The level of institutionalization often is viewed as a measure of the meaningfulness and value of the innovations in the society in which they function.

Institutionalization is an important aspect of any development project, but it takes on added significance for telecommunications and distance education projects. The organizational infrastructure of telecommunications and distance education projects is placed under additional stress from some of the unusual attributes of these types of organizations.

Two of the most important attributes affecting institutionalization are alluded to in the label for these kinds of projects: "technology" and "distance." The technology component is usually large and sophisticated and plays a crucial role in the success or failure in attaining required organizational outputs. The organization usually covers a large geographic area. Both of these attributes require a well-developed and well-organized internal structure, and ample resources of all kinds. Unfortunately, this is precisely where most lesser-developed countries' (LDCs) organizations are weakest.

This report examines the institutionalization of three telecommunications projects. The projects were a part of the U.S. Agency for International Development's (USAID) Rural Satellite Program (RSP). The report examines the three projects from a generic institutional development perspective, discusses the institutional development anomalies of the projects, and makes institutional development recommendations for future telecommunications development projects. It is hoped that the lessons learned from the RSP will assist distance education and telecommunications planners in designing future projects of this kind.

Rural Satellite Program

For the past five years, the USAID-funded RSP has focused its efforts on developing the rural telecommunications applications in the Third World. The RSP was designed to:

1. Develop and test models of how communications satellites can help provide information and services necessary for rural development.
2. Support the development of national capacities within LDCs to integrate telecommunications investment planning with sectoral programs for rural development in education, health, agriculture, or other rural development activities.
3. Provide evidence of the benefits of rural telecommunications investments to international lending agencies investing in rural development.

4. Demonstrate to communications carriers and equipment suppliers the need for, the utility of, and the market for communications services in the rural areas of LDCs.
5. Assist in lowering the cost of earth stations appropriate for LDC rural development use through demonstration of appropriate technology and applications on a pilot scale in anticipation of later large-volume markets for operational systems.

To realize these goals, RSP projects were implemented in three locations: Indonesia, Peru, and the West Indies. Following are brief descriptions of the three projects.

RSP Project in Indonesia

For several years the Government of Indonesia has been implementing a policy of eastward-bound development. The eastern islands of Indonesia are the least developed in the archipelago. This is true in all sectors, including higher education. Most of the universities in the eastern islands are relatively new and have few faculty members with advanced degrees (Ph.D. level) in their disciplines. The RSP project in Indonesia, called SISDIKSAT (Indonesian acronym for Distance Education Satellite System), was designed to improve the quality of instruction in higher education and to provide academic experiences to university students and instructors in the eastern islands where these experiences did not previously exist. Two Indonesian educational futurists, the former Director General of Higher Education and the former Rector of Hasanuddin University, with inputs from USAID, foresaw the utility of creating a satellite-based telecommunications network linking the public universities in the eastern islands.

The SISDIKSAT project necessarily involved two government ministries. PERUMTEL (Indonesian acronym for Public Telephone Company), an agency within the Ministry of Tourism, Post, and Telecommunications, owns and operates Indonesia's telecommunications system. By design, SISDIKSAT would provide "electronic classrooms" for each location. These classrooms would link up with the existing telecommunications network in an effort to make use of established communications capabilities and reduce costs. The Ministry of Education and Culture is responsible for all education activities within Indonesia, and therefore, was the logical and only legally viable home for SISDIKSAT.

SISDIKSAT is a multi-point teleconferencing network using two dedicated satellite channels. One channel is dedicated for audioteleconferencing. The second is used for facsimile text, computerized audiographics, and private telephone services. Each site has an electronic classroom which includes microphones and convener, computerized graphics display equipment, video monitors, facsimile equipment, backup power supply, and bridging equipment to interface the classrooms with the national telephone network operated by PERUMTEL.

The SISDIKSAT network links 15 sites. Twelve are members of the Eastern Islands Universities Association (BKS) and are in the eastern islands, spanning approximately 2,000 miles from Kalimantan to Irian Jaya. Three sites are located on Java--the office of the Directorate General of Higher Education in Jakarta, the Bogor Agricultural Institute, and the Open University headquarters near Jakarta.

SISDIKSAT began operating in August 1984. Applications activities focused on course delivery, professional upgrading and training of university faculty, and technical

skills training. Some non-BKS user groups have utilized the network, most notably the Indonesian Open University.

In terms of generated outputs, SISDIKSAT can be deemed a success. During its first three years of operations the network delivered 60 courses to approximately 10,000 students. Twenty-eight seminars were conducted, attracting 1,800 participants. Numerous technical skills training exercises have been conducted over the network for SISDIKSAT local operators and technicians. The Open University currently uses the network eight hours per week for tutor training and other activities.

Although outputs and interest have been high, institutionally SISDIKSAT has had difficulties. The institutional development aspects of the SISDIKSAT project are explored later.

RSP Project in Peru

Geographically, Peru is a country of contrasts. The coastal plain is a desert. Because the desert is accessible by sea, however, the Spanish settlers established their homes on the coastal plain. Today the majority of the larger cities, including the capital of Lima, are located in the desert. Inland, Peru claims part of the backbone of the South American continent, the Andes Mountains. The eastern border of Peru consists of lush tropical forests--part of the Amazon jungle.

The highlands and jungles of Peru are the least developed, socially and economically. A former president of Peru, Fernando Belaunde Terry, hoped to develop the interior to capitalize on its agricultural potential and to stem the migration of the poor from this region to the large coastal cities, thus easing urban social and economic problems.

In 1978 planners and policymakers from Peru's telephone authority, ENTEL, and the Instituto Geofisico enthusiastically supported the development of a satellite-based, rural communications network which would provide a basic communications infrastructure for further economic and social development in the interior. Together with officials from USAID-Washington, they proposed to establish the Rural Communications Services Project (RCSP). The decision to house the project within ENTEL presumably stemmed from a more general approach to regional development through telecommunications, including telecommunications services for individuals, businesses, and government agencies.

The RCSP was designed to provide public and private telephone and audioteleconferencing services to the Department of San Martin in the Huallaga River valley. The system consists of satellite (INTELSAT) links between Lima and three primary sites equipped with earth stations. Four secondary sites are connected to one of the primary sites by radio links. Audioteleconferencing "classrooms" are located at all seven sites, at Tarapoto (also in the Department of San Martin), and in the ENTEL headquarters in Lima. The teleconferencing equipment includes microphones and speakers, an audio convener, and bridging equipment to interface with the ENTEL network. The RSP was responsible only for the audioteleconferencing applications.

The RCSP's social applications activities are multi-sectoral. The Ministries of Health, Agriculture, and Education use the teleconferencing services to communicate with ongoing development program personnel, for internal administrative purposes, to

supervise field staff, and for in-service and continuing education programs. Audioconferences for administrative meetings, training, and medical consultations grew in popularity and frequency as the user groups became familiar with the technology and the teleconferencing operational format.

Audioteleconferencing activities were adversely affected by technical problems during the first two years of the RCSP. The secondary sites participated in 10 percent or less of the scheduled teleconferences in 1984. Also in 1984, 37 percent of the 426 teleconferences that were planned were not executed. The Ministries of Education and Health are the biggest users of teleconferencing services (107 and 101 completed teleconferences, respectively, for 1984). During the same year, the Ministry of Agriculture completed 33 teleconferences; ENTEL completed 25. In-service training was the most frequent activity. This was followed by administration and diffusion/promotion, and coordination and medical consultation.

After the major technical problems were solved, the teleconferencing activities also improved. In 1984, 14 percent of the audioteleconferences were cancelled for technical reasons. In 1985, however, only 4 percent were cancelled for the same reasons. Between 1984 and 1985, sectoral activities showed an overall increase. A total of 392 audioconferences were successfully completed in 1985, and total enrollment reached 10,000 person sessions.

RSP Project in the West Indies

The West Indies is an island chain extending in an eastward arc from the southeastern United States to the northern shore of South America. It consists of several small island nations, all former British colonies. After gaining independence in the mid to late 1960s, these island nations formed a federation called the West Indies Associated States. They also established a regional university, the University of the West Indies (UWI), with the main campus located on the island of Jamaica.

For many years UWI has served the higher education needs in the Caribbean region. After earlier experiments with telecommunications-based educational activities proved successful, UWI expressed interest in establishing formal distance education programs. UWI's experience and interest in distance education and its status as the only regional university in the Caribbean made it the logical choice as the institutional home for an RSP project. In May 1982, USAID signed an agreement to provide support for the University of the West Indies Distance Teaching Experiment (UWIDITE) through the RSP.

UWIDITE's technical system uses a variety of telecommunications technologies. The network links six of UWI's campuses and extramural centers through INTELSAT, microwave, and UHF radio connections. The system uses only one channel. A variety of local and international carriers are responsible for the maintenance and operation of the communications network.

The classroom technical configuration and capabilities are similar to those of the SIDSAT classrooms. Each UWIDITE classroom has audioteleconferencing capabilities. The audio equipment consists of microphones and speakers, an audio convener, a private telephone, and telecommunications bridging equipment. In addition, each site has a slow-scan video set with telewriter and video cassette recorders and monitors. It should be noted that the RSP provided only the audio equipment. The video equipment was procured and installed by UWI.

The applications program includes a variety of regular UWI academic activities. These can be broken down into several categories:

1. Courses that lead to UWI qualification include Certificates of Education in teaching the hearing impaired, reading, and mathematics; Social Science Program (first year); Certificate in Public Administration; and law tutorials.
2. Courses not leading to UWI qualification are delivered for the program in Continuing Medical Education in Reproductive Health.
3. Outreach activities include delivery of the Secondary School Science Laboratory Technicians course (in-service training), Nutrition for Community Workers, training for day care personnel, agriculture seminars, consultations with the Cardiology Group of the University Hospital, psychiatry training, and others.
4. The remaining applications activities focus on medical and student/teacher consultations, university meetings, administration, professional and academic development for UWI faculty, and UWIDITE project administration and training.

Although UWIDITE activities vary greatly, the outputs have been much smaller than the SISDIKSAT project. The number of students and participants attending UWIDITE activities ranges from 14 to 68. The average class size is 30 students (SISDIKSAT courses average over 100). This may be because UWIDITE delivers many graduate-level courses and in-service training programs, which usually attract smaller groups.

INSTITUTIONAL DEVELOPMENT: A CONCEPTUAL DESCRIPTION

The three RSP projects emerge as an interesting study of similarities and contrasts in individual purpose, project design and structure, and institutional configuration, but at the same time, sharing a common need and commitment to use telecommunications as a means of furthering national and regional development in remote or rural areas. From an institutional development standpoint, these projects are a study of contrasts. This section reviews the pertinent research and conceptualizations of a selection of authors dealing with the institutionalization of international development projects (innovations). The concepts have been condensed and simplified to suit the purposes of this report.

Institutions, Organizations, and Institutional Development

A number of researchers and analysts have defined institutions in divergent ways. Hiram Phillips' (1969) definition implies that "institutions" and "organizations" are synonymous.

The term "institutions" . . . refers to organizations staffed with personnel capable of carrying out defined, but evolving, programs contributing to social and economic development and having enough continuing resources to assure a sustained effort for establishment, acceptance, and application of new methods and values. (p. 20)

Conversely, Hollis Peter (1966) makes a distinction between institutions and organizations.

Institutions are special types of organizations which embody certain values and norms, represent them in society, and promote them. In this special meaning organizations do not qualify as institutions if they perform technical functions which are purely instrumental and which do not embody values that become normative in society. Institutions are thus a sub-class of large-scale organizations which have explicit, overt, purposeful programs of discriminating and promoting certain sorts of values. (p. 343)

Whether or not institutions and organizations are synonymous seems not to be of great importance here. Innovations introduced through development projects which ultimately become an integral part of an institution or organization bring about change in the environment and are valued by society and considered to be significant and worthwhile additions to the socioeconomic milieu in which development is taking place. Thus, the process of institutionalization of innovations or institutional development is of greater concern in this study.

For the purposes of this report, Norman Uphoff's definition of institutional development, taken from his paper presented at the Seminar on Institution Building and Development (June 1971), is used as a working definition of the term.

Institutional . . . [development] involves the introduction and establishment of "organizations" which in turn induce changes in patterns of

action and belief in society. Most commonly, these changes are associated with new "technologies," both physical and social. The crux of the . . . [institutional development] process is moving from introduction to establishment . . . (p. 21)

The use of quotation marks with the terms "organizations" and "technologies" presumably connotes less restrictive interpretations of these two terms. This approach is favored for the purposes of this report.

To minimize confusion, the following terms and definitions are used throughout the remainder of this report:

<u>Organization</u>	An institution (social, political, economic entity) with a defined structure, available resources, a purpose, and a set of activities that are of value to the socioeconomic milieu.
<u>Institution</u>	This is used interchangeably with the term "organization."
<u>Project</u>	The new organization or institution created by the RSP to introduce telecommunications innovations into the environment for the purpose of advancing socioeconomic development.

Internal Organizational Elements

There are five major elements that are necessary to explain the systematic behavior of an institution. Thus, these elements provide a convenient framework for the analysis of the three RSP projects found in the following section. The elements are:*

● **Leadership.** Leadership is the individual or group of individuals who formulates the doctrine and program of the institution, and who directs its operations and interactions with the environment. Strong leadership must possess political viability, professional status, technical competence, organizational competence, and continuity. Leadership is considered to be the most important element of the institutional development process.

● **Doctrine.** Doctrine is the set of goals, purposes, objectives, and operational methods that directs the institution's program. The doctrine should be specific and directed toward meeting perceived societal needs. It should not deviate greatly from existing norms, and it should be on the cutting edge of societal preferences and priorities.

● **Program.** The institutional program is the set of activities and implementation strategies that produces the outputs of the organization. It is a concrete and action-oriented derivative of the doctrine. The program should be consistent, stable, and contribute to societal needs.

* From Milton Esman (1967) pp. 3-4.

- **Resources.** The resources of the organization are the financial, physical, human, technological, and informational inputs of the institution. Resources should be available and in sufficient qualities to meet the requirements of the program.

- **Internal structure.** The internal structure of the institution consists of the processes and procedures used for the operation and maintenance of the organization. Management systems, channels of communications, personnel policies, and patterns of authority are examples of some of the components that make up the internal structure of the organization. The internal structure should be adaptable and consistent.

The significance of technological resources cannot be overstated. In fact, these resources are so important that they should be considered as the sixth required element to ensure the successful institutionalization of telecommunications development projects.

Institutional Linkages

An internally strong institution is not sufficient for organizational viability. In addition, the institution must establish and maintain linkages with other institutions if it expects to implement its program effectively and, thus, change the environment.

The . . . organization does not exist in isolation; it must establish and maintain a network of complementarities in its environment in order to survive and to function. The environment, in turn, is not regarded as a generalized mass, but rather as a set of discrete structures with which the subject institution must interact. The institution must maintain a network of exchange relationships with a limited number of organizations and engage in transactions for the purposes of gaining support, overcoming resistance, exchanging resources, structuring the environment, and transferring norms and values. (Milton Esman, 1967, p. 5)

In the same paper, Esman defined four types of linkages: enabling, functional, normative, and diffuse. This report deals with only two, enabling and functional.

<u>Enabling</u>	Relationships with organizations that control the allocation of authority to operate or of resources.
<u>Functional</u>	Relationships with organizations that supply needed inputs or which take outputs. (p. 22)

The Process of Institutional Development

This section discusses some of the key points aimed at institutionalization of a development project. This is essentially an integration of the previous two sections.

There are two general approaches to bring about the institutionalization of innovations introduced through a development project. The first approach is to create a new organization. The project itself can be the new organization, or a new host-country organization can be created with the development project included as a part of it. The second approach is to identify an existing host-country institution which can act as the host organization for the development project. The development project is then attached to this host organization.

In most cases, the first approach is the least desirable of the two. Establishing the internal organizational elements and linkages is a time-consuming process when there is no existing base from which to start. When the second approach is used, the key is to select an existing host-country organization with the following qualifications:

- has a need for the development project innovations (the existing organization's doctrine is consistent with the goals of the project);
- has established and effective internal elements (strong leadership, a well-defined doctrine, sufficient resources, etc.); and
- has established linkages with other institutions in the environment that can support the integration of the project's innovations (the project's innovations are valued by other organizations either as a consumer of their outputs, a provider of required inputs, or as support for their own goals).

In reality, it is seldom possible to identify an existing organization that is fully qualified on all points. Then the development project must assume the task of strengthening the existing organization where it is weak. During the project design phase host organization weaknesses should be assessed. The project design should take into account these weaknesses, and wherever possible, project components and inputs be provided to strengthen the weak elements within the host organization.

Phases in the Institutional Development Process

Development projects follow certain phases or steps from pilot project to full project integration into the organizational environment during the process of institutionalization. These phases are summarized below.

- Recognize the need for the innovation.
- Analyze organizational requirements to implement the innovation.
- Select the host organization or create the project as a new organization.
- Design the project, including project resource requirements, taking into account host organization weaknesses.
- Initiate project implementation aiming to develop organizational components to carry out the project's program effectively.
- Pilot test the project program on a small scale.
- Revise project components and resource inputs based on analysis of pilot test outputs.
- Implement project program full scale.
- Withdraw outside project resources. If innovations endure, the project has become fully institutionalized.

When operationalizing the institutional development process, the following points should be kept in mind.

- Leadership, resources, and internal structure are the three most important internal organizational elements. For telecommunications projects the resource components of the technical system and personnel are crucial.

- In the early stages of institutional development, strong leadership is extremely important. Obviously, the best leadership will be a host-country national, not a foreign advisor from the project.
- To a certain extent, leadership and resources are interchangeable, with the exception of technological resources. If resources are scarce, a strong and effective leader can direct the efficient use of the resources without jeopardizing the program. Conversely, if resources are abundant, the organizational inefficiency created by weak leadership should have a minimal effect on the program.
- The internal structure of the organization can be manipulated to build strong linkages. The management systems, communications systems, lines of authority, etc. should be changed to facilitate the establishment of enabling and functional linkages; these are the linkages that provide resources, provide legitimacy to the organization, and create a corps of clients that becomes dependent on the organization's outputs.
- A host-country staff capable of implementing the innovative aspects of the program is a crucial resource. Thus, staff training and development should be a high priority.
- The visibility and stability of the program outputs help ensure that the program will be valued by the environment.

This section has discussed institutional development from a conceptual standpoint. The following section applies these concepts and points to the three RSP projects.

ANALYSIS OF THE INSTITUTIONALIZATION OF THE THREE RSP PROJECTS

The West Indies and Peru projects have attained a greater level of institutionalization than the Indonesian project. UWIDITE has reached a very high level of institutionalization. This results from strong leadership and an institutional configuration that are almost totally encompassed by the UWI organization. The only outside linkages are with the telecommunications organizations carrying the UWIDITE communications and with INTELSAT. In addition, UWI has an established organizational internal structure that can effectively accommodate remote locations. Because ENTEL has been able to adapt to the needs created by a project with a strong socioeconomic development focus, the RCSP has been effectively institutionalized, although probably not as completely as UWIDITE. SISDIKSAT, on the other hand, still suffers from an absence of strong leadership, a weak organizational structure, and a failure to establish strong enabling and functional linkages. Surprisingly, this failure has occurred within the Ministry of Education and Culture. SISDIKSAT has been able to establish a strong enabling linkage with PERUMTEL, an agency within the Ministry of Tourism, Post, and Telecommunications.

All of the projects applied the second institutional development approach and were attached to existing host country/regional institutions rather than set up as new, totally independent organizations. The SISDIKSAT project was attached to the BKS, a consortium of institutions of higher education. The RCSP was attached to ENTEL-Peru, the national telephone authority. The UWIDITE project became a part of the University of the West Indies, a Caribbean regional university.

Each project's doctrine was well defined and consistent with the perceived needs of the environment as defined by the development policies of the governments and/or policymakers at each RSP location. In fact, the high doctrinal correlation between the projects and their host organizations was one of the major criteria for selection of the host organization. SISDIKSAT's doctrine supported the Indonesian government's policy of eastward-bound development by focusing on the improvement of the quality of higher education in the eastern part of Indonesia. The doctrine of the RCSP supported the Peruvian government's intention to develop the interior jungle region into a major commercial center helping to solve many of Peru's pressing social and economic problems. The UWIDITE project doctrine supported the strengthening of the Caribbean's only regional university.

All the host institutions lacked one crucial physical resource, the technical system (a satellite-based, classroom-to-classroom, telecommunications network) necessary for the implementation of the programs. USAID helped provide this resource, either directly or through the RSP projects. Each host organization received engineering services for system and classroom equipment design and installation. Funds were provided for the procurement of classroom equipment. ENTEL also received funds for the procurement of three earth stations. The RSP paid UWI's common carrier costs during the life of the UWIDITE project.

All the host organizations through their respective RSP projects also received advisory services and staff training. The advisory services covered project management and implementation, program development and implementation, and the guidance of and lobbying for the institutionalization of the project innovations. Host institution staff training was provided in three areas--distance education systems, program development

and implementation, and technical system operation and maintenance. It is safe to conclude that all three projects began with similar, sufficiently high potentials for institutionalization of the project innovations. USAID and the RSP provided a standard set of inputs (feasibility study-based site selection, project design, technical assistance, procurement, and training) that experience has proven is usually successful in fostering effective institutionalization of innovations. What contributed to the institutional development successes and deficiencies of these three projects? The remainder of this section addresses this question.

Analysis of Institutional Configurations

The Indonesian organizational configuration begins to explain why SISDIKSAT has had institutional development difficulties. SISDIKSAT actually is an independent organization, even though its designated host organization is the BKS. The BKS is a loose confederation of universities that has very little political power. The BKS defers to DIKTI (Directorate of Higher Education) for all policy decisions and has no routine funding base. Most of the universities in the association prioritize their own individual needs higher than the needs of the association.

SISDIKSAT's primary enabling organization is DIKTI, the policymaking body for all of Indonesian higher education. DIKTI placed SISDIKSAT under BKS jurisdiction but retained control of SISDIKSAT's government funding. DIKTI physically located the SISDIKSAT central office at Hasanuddin University (UNHAS) in Ujung Pandang, South Sulawesi, some two hours by air from the DIKTI offices in Jakarta. The linkages between these three organizations remain weak because of resource and administrative deficiencies. These deficiencies are discussed in more detail later.

The functional (input) organizations are PERUMTEL and IPB (Agriculture Institute of Bogor). PERUMTEL was responsible for linking all the SISDIKSAT classrooms through the Palapa domestic satellite. The SISDIKSAT-PERUMTEL linkage is very strong. In fact, SISDIKSAT has induced changes in PERUMTEL's program to support socioeconomic development in Indonesia. This linkage has been one of the highlights of the SISDIKSAT experience. Although not a BKS member university, IPB was included in the network so that it could share its agricultural expertise with the eastern islands universities. IPB has acted only as a functional (input) institution, delivering two to three courses per semester and offering seminars. IPB students have never taken a SISDIKSAT course. The remaining functional organizations are the recipients of SISDIKSAT program outputs, the member universities of the BKS.

Comparing the three projects, the Indonesian institutional configuration is the only one where the primary enabling organization and the host organization are not one and the same. In addition, SISDIKSAT is the only project which was not physically and administratively an integral part of the host/enabling institution. Without well-developed internal elements, such as leadership, resources, and internal structure, this configuration cannot support institutional development.

A more parsimonious institutional configuration emerged in Peru. ENTEL became both the host and primary enabling organization for the RCSP. To further integrate the RCSP's social applications-oriented doctrine and program into ENTEL's engineering and technology-oriented program, ENTEL created a new department called the Department of Socioeconomic Affairs. In addition, ENTEL opened a field operations office in the

project zone to assist with the coordination of program activities with Lima. The integration of the project, host organization, and primary enabling organization eases some of the pressure on project leadership and internal structure to establish strong enabling linkages because these linkages are entirely within one organization.

An interesting note on ENTEL's adaptability is its interaction with the Ministries of Education, Health, and Agriculture. In 1984 the functional linkages between ENTEL and the ministries were weak. This, in part, accounts for the poor completion rate of audio-conferences during that year. ENTEL recognized the difficulties, outlined corrective actions, and implemented them. In early 1985, ENTEL hired a Lima-based coordinator to work with the ministry offices in the capital to improve their involvement in the teleconferencing activities. The increase in audioteleconferencing completion rates for the Ministries of Education and Agriculture is evidence that this new tactic was successful.

The West Indies configuration goes one step beyond the Peru configuration by integrating the functional (output) groups into a unified, project/host/primary enabling organization. This is the most powerful institutional configuration because it places control of all aspects of the institutional development process within one organization.

Leadership

As stated earlier, research has shown that leadership is the most important institutional development variable. Strong leadership, to a certain extent, can compensate for weak resources and internal structure and is instrumental in establishing strong linkages. In social applications-oriented telecommunications development projects where great distances are covered, the technical system component (physical resource) must function reliably, and strong functional (input) linkages must be established with national and international telecommunications organizations, the organization's leadership takes on even greater responsibilities. The RSP projects' host-country leadership components vary from very strong to weak.

Leadership in LDCs often is constrained by the very political and organizational attitude or mentality that is required to move national development along at an effective pace. This mentality is characterized by an intolerance for independent thinking, creativity in decision-making, and problem solutions that fall outside rigidly defined policy. In many cases, the strong leaders of today were the political outcasts of yesterday. In addition, the desire for personal gain often is stronger than the need to accomplish development goals.

The strongest leadership is in the West Indies. UWIDITE leadership was committed to satellite-based distance education well before the signing of the RSP-UWIDITE project agreement. UWI had experimented with satellite-transmitted television lessons during the late 1970s. The leadership was confident enough in its own organization (UWI) that it refused to continue outside project management and program technical assistance after the first year of the project. The UWI/UWIDITE leadership was able to arrange for additional classroom equipment procurement funds on its own and outside the RSP project. It also has maintained very complex linkages with regional common carriers and INTELSAT with very little outside intervention.

RCSP leadership in Peru is very wisely arranged. The primary leadership of the RCSP, the ENTEL project director, previously was the director of ENTEL's Office of International Affairs. Before joining ENTEL he was a social scientist for Peru's Instituto

Geofisico--one of the institutions that worked with ENTEL during the early planning phases of the project. Thus, the RCSP's director brought with him to the leadership post a social science background, project doctrine and program-related experience, experience with the existing ENTEL leadership, and a familiarity with the INTELSAT organization which provides the satellite services for the project. This is an example of a good match between the individual and the position of leadership.

The SISDIKSAT project is not so fortunate. An agro-economist was appointed as the SISDIKSAT director. He split his duties between the SISDIKSAT directorship and a regular faculty position with UNHAS. He had no direct connection with the BKS leadership, although UNHAS is one of the three coordinating universities for the BKS consortium. The RSP did support some distance education training in the United States for the director, helping to familiarize him with telecommunications-based, social applications programs. During the second year of the project he took an appointment in Jakarta, thus leaving the SISDIKSAT central office in Ujung Pandang without any high-level leadership. This void still exists.

Resources

Resources, always, are considered one of the key elements in the institutional development process. Usually the focus is on financial resources. Obviously, there is a minimum level of financial resources which is required to operationalize the project. The RSP experience, however, indicates that for social applications-oriented telecommunications projects, two other resources are equally as important or more important than financial resources. These two resources are the technical system, a physical resource, and personnel.

A functioning technical system is a prerequisite for the implementation of the program. Delays in program implementation adversely affect the institutionalization of the project innovations. In other types of development projects, it often is possible to focus implementation efforts on other components when one component is behind schedule. In RSP-type projects, program implementation must wait for technical system completion because it is the only means of delivery for program activities.

Because the technical system resource plays such a crucial role in the process of institutionalization, every effort should be made to ensure that the technical system design supports the organization's program, is compatible with existing support infrastructures, and that it can be operationalized in a timely fashion. There is no room for compromise on any of these points. Both the Indonesian and Peruvian projects encountered delays in implementing their program activities because of technical system difficulties. There is no need to describe the problems in detail. It is sufficient to say that they were related to system design; equipment procurement, shipping, and installation; and the quality of the existing telecommunications networks. It is fair to mention that many of the difficulties were outside the control of the project and, in some cases, even the host organization. In some instances, however, oversights were made in assessing the ability of the existing telecommunications systems to support RSP technology, system design was too sophisticated, and compromises were made to the host governments which delayed system installation and adversely affected system operations.

In planning for technical system operationalization, ample time should be allowed for equipment procurement, installation, and testing. This is especially true when dealing with technology in remote locations. Other project activities should be phased so that

they will not be adversely affected if the technical system encounters delays. Conservative planning should be the rule when preparing time estimates for equipment procurement and installation and when introducing the program activities which will be delivered by the technical system.

Personnel is a resource that deserves special emphasis in institutionalizing RSP-type projects. The development and implementation of the technical system and the program innovations require special skills which, in most cases, are not indigenous to LDC academic and engineering manpower groups. Training, especially in-service training, is the answer to providing and maintaining skills in new skill areas. In-service training helps maintain critical technical skills that may be used only occasionally. The in-service training programs should be media-based and education-based to reach all remote staff without the necessity of bringing them to a central location for training. This has proven to be the most efficient and cost-effective approach in RSP-type projects. SISDIKSAT developed an effective in-service training program by conducting staff development and technical training workshops at a distance and developing training manuals and training materials on video cassette.

Another critical component of personnel resources is staff discipline. Staff members must adhere closely to equipment operations and maintenance and repair procedures and schedules if the hardware is to be kept in top operating condition. Program activities development and delivery also require detailed scheduling and adherence to deadlines. Cultural factors sometimes work against the establishment of staff discipline and punctuality. Strong leadership and management systems are the best means of instilling a sense of discipline and punctuality in staff work habits.

Internal Structure

Distances, the remoteness of field units, the technical system, and system usage costs place added strain on the organization's internal structure. A well-defined management system with clear lines of authority is a necessity. Frequent management-staff interaction helps dispel the sense of isolation felt by remotely located staff. The technical system can be used as the organization's own communications network. This has two positive attributes. It lowers the institution's communications costs; and it increases familiarity with the technical system, both the hardware and usage styles.

The three projects' internal structures vary from strong to weak. As might be expected, UWIDITE's internal structure is the strongest. This probably can be attributed to a unified institutional configuration and strong leadership. In early 1983, ENTEL/RCSP improved their internal structure with the appointment of a new director of the Department of Socioeconomic Affairs and, shortly after, the establishment of a branch office in the field. SISDIKSAT, struggling with an unmanageable institutional configuration and no leadership, could never establish a sound internal structure. SISDIKSAT's Ujung Pandang-based administrators frequently were forced to fly to Jakarta to confirm management decisions and request funds. Middle-management and lower-level personnel never were given official appointments to the project.

The administrative and coordination usage data from the three projects is very revealing. During the 1983-84 academic year, 22 percent of the total UWIDITE system usage time was utilized for project administration and coordination. UWIDITE scheduled two hours per day for these activities. During approximately the same time period, 14.2 percent of all RCSP audioteleconferences were used for project administration and

coordination. All of ENTEL's teleconferences (9.3% of the total) were for project management purposes. On the other hand, SISDIKSAT's project management use of the system has been infrequent, informal, and ad hoc. These data might be used as one indicator of the strength of the internal structures of each organization.

Conclusions

In conclusion, something should be said about the overall level of institutional development attained by each of the projects. The above discussion has identified some institutional development strengths and weaknesses of the three RSP projects using a conceptual framework based on institutional development research. Whether the innovations introduced by these projects have been sufficiently institutionalized is not easy to determine at this time. One test of the institutionalization of these projects is their ability to survive. External development support just recently terminated, and it is too early to assess the probabilities of survival.

The previous analysis does suggest that UWIDITE's and RCSP's chances are good. Institutionally, SISDIKSAT is at a much lower level of development. It needs an injection of capable, respected leadership and an institutional affiliation with a more dynamic, well-managed organization if its chances for long-term survival are to improve.

One positive note on SISDIKSAT's behalf is the institutional impact it has had on PERUMTEL. PERUMTEL has supported SISDIKSAT well beyond original expectations. Virtually all SISDIKSAT requests for special services (installing miles of new telephone lines, dedicated use of earth station modems, etc.) were approved without hesitation. As a result of its relationship with SISDIKSAT and the expansion of services into social development areas, PERUMTEL has developed a close, supportive relationship with the Indonesian Open University. Apparently PERUMTEL values the educational innovations introduced by SISDIKSAT and the Open University as a means of involving telecommunications in more broadly defined areas of national development.

RECOMMENDATIONS FOR FUTURE PROJECTS

The following recommendations are derived from the "lessons learned" in developing and implementing the RSP's three social applications-oriented telecommunications development projects in Indonesia, Peru, and the West Indies. All of the recommendations should be preceded by the qualifying phrase, "whenever possible," because project policymaking usually is affected by factors (host-country politics, the existing government infrastructure, environmental constraints, etc.) which are outside the control of the project policy development group. These recommendations can be used as guidelines (things to consider) when structuring the institutional development component of the project.

- Select institutional affiliations that most closely approximate a unified institutional configuration (UWI/UWIDITE-type).
- Strong leadership is crucial at the beginning of a development project. Select strong leadership with the following characteristics: a host-country individual or group of individuals with credibility (authority figure), belief in and commitment to the project doctrine, previous experience with telecommunications' social applications, and full-time availability to the project.
- Determine the minimal level of resources necessary to implement the project program. Secure the required resources, focusing attention on minimally required financial resources, technical system, and personnel. Staff development should focus on maintenance, skills training, discipline, and punctuality.
- Develop a strong media-based and distance education-based in-service training component to establish and maintain personnel skills.
- Establish a strong organizational internal structure focusing on management systems and an intra-organizational communications network using the project's technical system. Establish clearly defined lines of authority from top to bottom.

REFERENCES

- Blase, Melvin G., Institution Building: A Source Book. Midwest Universities Consortium for International Activities, Inc., for the United States Agency for International Development. Michigan: LithoCrafters, Inc., 1973.
- Centre for Economic Development and Administration. Proceedings: Seminar on Institution Building and Development, June 26 to June 30, 1971. CEDA Study Series Seminar Paper No. 1. Nepal: The Centre, 1971.
- Esman, Milton J., "The Institution Building Concepts--An Interim Appraisal." Graduate School of Public and International Affairs, University of Pittsburgh, 1967.
- Hodgdon, J., Kerpelman, L., and Zaman, S., "Final Report, Rural Satellite Program: Evaluation Management Contract." Abt Associates, Inc., for the United States Agency for International Development. Massachusetts: Abt Associates, January 1986.
- Mayo, J., Cruz, M., Heald, G., and Klees, S., "Peru Rural Communications Services Project: Interim Evaluation Report." Center for International Studies, Learning Systems Institute, Florida State University, for the United States Agency for International Development. Florida: Learning Systems Institute, July 1985.
- Peter, Hollis W., editor, Comparative Theories of Social Change. Michigan: Foundation for Research on Human Behavior, 1966.
- Phillips, Hiram S., Guide for Development: Institution-Building and Reform. New York: Praeger Publishers, Inc., 1969.

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:

- **An Overview of the AID Rural Satellite Program**, Tietjen, K.
- **The Design and Installation of Rural Telecommunications Networks: Lessons from Three Projects**, Goldschmidt, D., Tietjen, K., and Shaw, W. D.
- **Distance Education via Satellite in Indonesia**, Shaw, W. D.
- **An Analysis of the Costs and Revenues of Rural Telecommunications Systems**, Goldschmidt, D.
- **A Handbook for Planning Telecommunications Support Projects**, Tietjen, K.
- **Training for Technology Transfer in Telecommunications Support Projects**, Tietjen, K.

Also included in the series is a report prepared by Florida State University:

- **An Evaluation of the Peru Rural Communications Services Project**, Mayo, J., Heald, G., Klees, S., and Cruz, M.

Other Rural Satellite Program reports available are:

- **Telecommunications Services for Agriculture and Rural Development: Experiences of the AID Rural Satellite Program**
- **Telecommunications Services for Health Care: Experiences of the AID Rural Satellite Program**
- **Peru Rural Communications Services Project: Final Field Report**

Copies may be obtained from:

Dr. Clifford Block
United States Agency for International
Development
Bureau for Science and Technology
Office of Education
Washington, D.C. 20523
U.S.A.
(703) 235-9006

Ms. Karen Tietjen
AID Rural Satellite Program
Academy for Educational Development
1255 23rd Street, N.W.
Suite 400
Washington, D.C. 20037
U.S.A.
(202) 862-1900

Acknowledgements

The following individuals are among the many who have contributed to the success of the AID Rural Satellite Program:

Agency for International Development

Bureau for Science and Technology

Office of Education

Clifford Block
Peter Spain
Robert Schenkkan
Lawrence Frymire

Office of Energy

Shirley Toth

Bureau for Latin America and Caribbean

Office of Development Resources

Richard Martin

Academy for Educational Development

Karen Tietjen
Willard Shaw
Hugh Orozco
Luis Medrano
Michael Calvano
John Tatlock
Sandra Lauffer
Anna Stahmer
Douglas Goldschmidt
Frank Dall
Jay Miller
Peter Boynton

Florida State University

John Mayo
Gary Heald
Steven Klees
Martha Cruz
Diefla Pramono

NASA—Lewis Research Center

William Bifano
Richard DeLombard
Anthony Ratajczak

Abt Associates

Larry Kerpelman
John Hodgdon
Elaine Mason

Institute for Telecommunication Sciences

Peter McManamon
Ray Jennings

SISDIKSAT—Indonesia

Sidharta Pramoetadi
Hasyah Haneng
Tahir Ali
Rajab Johari
Rhiza Sadjad
I. G. N. Agung
Purwadi Harto
Soedarko
Bambang Riady Oemar
Iip A. Arief
Abd. Muis Ba'dulu
Musyi Amal
M. Lawele
Mirhanuddin
Yan Pieter Karafir
K. W. Timboeleng
F. Manuhutu
Zainuddin
Soedarto
Emir A. Siregar
L. A. Sinsuw

UWIDITE—West Indies

Gerald Lalor
Christine Marrett
Diana Grant
Keith Huente
Max Richards
Marilyn Floissac
Roy Braithwaite
Elizabeth Campbell
E. R. Waldron
Christine Craig
Sadie Campbell
Edith Allen
Tony Walling
Keith Manison
Marlene Hamilton

ENTEL—Peru

Angel Velasquez
Felipe Yanes
Hector Cossio
Jorge Cisneros
Isabel Candia
Mildred Casanave
Margot Ruis
Victor Torres
Alippio Quincho
Ruth Cardenas
Gladys Infante
Angela Campos
Lili Aguila
Carmen Reategui
Cesar Arias