

26166884



This is to certify that the
thesis entitled
PROJECT CONDOR: REASONS AND CONDITIONS FOR THE
ADOPTION OF A COMMUNICATIONS SATELLITE FOR
THE ANDEAN SUBREGION
presented by

Leonardo Ferreira

has been accepted towards fulfillment
of the requirements for
Master of Arts degree in Telecommunication

Major professor

Date May 8, 1989

PLACE IN RETURN BOX to remove this checkout from your record.
TO AVOID FINES return on or before date due.

DATE DUE	DATE DUE	DATE DUE
218		
218		

**PROJECT CONDOR: REASONS AND CONDITIONS FOR THE
ADOPTION OF A COMMUNICATIONS SATELLITE FOR
THE ANDEAN SUBREGION**

By

Leonardo Ferreira

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF ARTS

Department of Telecommunication

1989

62000000

ABSTRACT

PROJECT CONDOR: REASONS AND CONDITIONS FOR THE ADOPTION OF A COMMUNICATION SATELLITE FOR THE ANDEAN SUBREGION

By

Leonardo Ferreira

After more than a decade of discussions, having a regionally-owned communications satellite in the Andean subregion became a priority for the signatories of the Andean Pact.

In this thesis both the evolution and structure of the Andean satellite plan and the reasons why it has been finally adopted, are the main foci of inquiry. CONDOR's principal characteristics in terms of antecedents, economic and financial profiles, politico-institutional framework, technical configuration and software aspects, are thus presented. Similarly, an analysis of the contextual conditions surrounding the satellite program is also carried out, including those major geographic, economic, political, socio-cultural and technological factors.

This thesis concludes that evidence tend to show that, from historical, geographic, technical, political and cultural standpoints, the Andean Pact countries do have enough reasons for launching a regional communications satellite of their own. However, project CONDOR faces the obvious obstacle of all major Third World initiatives: lack of financial means.

Copyright by
LEONARDO FERREIRA
1989

For the noble cause of integration of our beloved Andean republics.

This thesis is also dedicated to three wonderful women: my sweet little sister, my great mother and my dear wife.

ACKNOWLEDGEMENTS

I would like to express my gratitude to both Dr. Bella Mody and Dr. Joseph Straubhaar for their continuous and invaluable support, advice and contributions to this thesis. Also, I deeply thank the members of my family for their constant voices of encouragement and the information send over the years in order to complete this research. My special appreciation to Dr. Sylvia Ospina of COMSAT for her openness and the opportunity to exchange outlooks and materials on this subject. Finally, to Mrs. Mariela Galeano of the Ministry of Communications in Colombia, Mrs. Nelly Micheli and Ms. Nanette Pena, both at TELECOM-Colombia, my sincere appreciation for helping me gather data from their respective document centers.



TABLE OF CONTENTS

	<u>Page</u>
LIST OF FIGURES AND TABLES	vii
LIST OF MAIN ACRONYMS	viii
INTRODUCTION	1
<u>CHAPTER</u>	
I. CONDOR AND THE SUBREGIONAL CONTEXT	3
II. SUBREGIONAL TELECOMMUNICATIONS INFRASTRUCTURE AND INTEGRATION	32
III. THE CONDOR PROJECT	55
IV. ADOPTION CRITERIA	83
CONCLUSION	112
APPENDIX	135
BIBLIOGRAPHY	143

LIST OF FIGURES AND TABLES
(APPENDIX)

FIGURE 1	...	MAP OF THE ANDEAN PACT AREA
FIGURE 2	...	ANDEAN GROUP: STRUCTURE OF THE URBAN AND RURAL POPULATION IN 1986
TABLE 1	...	ANDEAN PACT: SOCIO-ECONOMIC INDICATORS
TABLE 2	...	TELECOMMUNICATION MEDIA RATES IN THE ANDEAN PACT AREA
TABLE 3	...	STATUS EARTH STATIONS IN PERU
TABLE 4	...	STATUS EARTH STATIONS IN COLOMBIA
TABLE 5	...	STATUS EARTH STATIONS IN VENEZUELA
TABLE 6	...	STATUS EARTH STATIONS IN BOLIVIA AND ECUADOR

LIST OF MAIN ACRONYMS

ASETA	Asociacion de Empresas Estatales de Telecomunicaciones del Acuerdo Subregional
Andino Enterprises	(Association of State Telecommunication of the Andean Subregional Agreement)
BRAZILSAT	Brazilian Telecommunications Satellite System (also known as SBTS)
CAF	Corporacion Andina de Fomento (Andean Development Corporation)
CAL/SATEL	Canadian Astronautics Limited/Satellite Telecommunications Consultants Limited Company
CANTV	Compania Anonima de Telefonos de Venezuela (National Limited Telephone Company of Venezuela)
CART	Comision Andina de Radio y Television (Andean Radio and Television Commission)
CATSAT	Comision Andina de Telecomunicaciones por Satelite (Andean Telecommunications Satellite Commission)
CAVISAT	Centro Audiovisual Internacional Via Satelite (International Via Satellite Audio-visual Center)
CCIR	International Radio Consultative Committee
CIDA	Canadian International Development Corporation
CITEL	Conferencia Interamericana de Telecomunicaciones (Inter-American Telecommunications Conference)
COMSAT	Communications Satellite Corporation
CTA	Comite Tecnico Asesor (Consulting Technical Committee)

DAS	Departamento de Asuntos Satelitales (Department of Satellite Affairs)
EEC	European Economic Community
ENTEL-Bolivia	Empresa Nacional de Telecomunicaciones de Bolivia (National Telecommunications Enterprise of Bolivia)
ENTEL-Chile	Empresa Nacional de Telecomunicaciones de Chile (National Telecommunications Enterprise of Chile)
ENTEL-Peru	Empresa Nacional de Telecomunicaciones del Peru (National Telecommunications Enterprise of Peru)
ESCO	European Satellite Consulting Organization
GSO	Geostationary Orbit
IBRD	International Bank for Reconstruction and Development
IDB	Inter American Development Bank
IETEL	Instituto Ecuatoriano de Telecomunicaciones (Ecuadorian Telecommunications Institute)
IFRB	International Frequency Registration Board
III	Instituto Internacional de Integracion (International Integration Institute)
INMARSAT	International Maritime Satellite Organization
INTELSAT	International Telecommunications Satellite Organization
ITU	International Telecommunication Union
JATEL	Jornada Andina de Telecomunicaciones (Andean Telecommunications Workshop)
JUNAC	Junta del Acuerdo de Cartagena (Board of the Cartagena Agreement)
OATS	Organizacion Andina de Telecomunicaciones por Satellite (Andean Satellite Telecommunications Organization)

PAFET	Proyecto Andino de Fabricacion de Equipos de Telecomunicaciones (Andean Project of Telecommunications Equipment Manufacturing)
PANAMSAT	Pan American Satellite Corporation
PQLI	Physical Quality of Life Index
RASCOM	Regional African Satellite Communications System
REDOC-SAITEL	Red de Documentacion del Sistema Andino de Telecomunicaciones (Documentation Network of the Andean Telecommunications Information System)
SAIT	Sistema de Informacion Tecnologica (Technological Information System)
SAT	Sistema Andino de Telecomunicaciones
SATCOL	Satelite Colombiano (Colombian Satellite)
SATEL	Sistema Andino de Teleinformatica (Andean System of Tele-informatics)
SATS	Sistema Andino de Telecomunicaciones por Satellite (Andean Telecommunications Satellite System)
SERLA	Sistema de Educacion Regional Latinoamericano (Latin American Regional Education System)
TDP	Trade Development Program
TELECOM	Empresa Nacional de Telecomunicaciones de Colombia (National Telecommunications Enterprise of Colombia)
TTC&M	Tracking, Telemetry, Telecommand and Monitoring Station
UNCOPUOS	United Nations Committee on the Peaceful Uses of Outer Space
UNDP	United Nations Development Program
USAID	United States Agency for International Development
WARC	World Administrative Radio Conference

INTRODUCTION

After more than a decade of discussions, in November 1984, having a regionally-owned communications satellite in the Andean subregion became a priority for the signatories of the Andean Pact (Bolivia, Colombia, Ecuador, Peru and Venezuela).¹

Their governments believe that because satellite-based communication technologies are playing a preponderant role in the development of nations (e.g. offering them the possibility of enjoying the benefits of more efficient telecommunication services), the adoption of a communication satellite for the Andean subregion is now an imperative. Yet, today, the satellite project, even inside the subregion, remains virtually unknown.

As in many other subregional initiatives, information on the CONDOR² project has been limited to small groups. Namely, a handful of Andean subregional experts in charge of the satellite network, the group of foreign communication multinationals doing business in the subregion, and the alien satellite agencies eager to get a foothold in this project. The purpose of this research is thus to make known relevant facts and information about the principal purposes for adopting the Andean satellite system, so that wider audiences can establish whether or not this project is worth pursuing.

In this thesis both the evolution and structure of the

Andean satellite project and the reasons why it has been finally adopted, will be the main foci of inquiry. CONDOR's principal characteristics in terms of antecedents, economic and financial profiles, politico-institutional framework, technical configuration and software aspects will thus be presented. Similarly, an analysis of the contextual conditions surrounding the satellite program will also be made, including those major geographic, economic, political, socio-cultural and technological factors.³

To begin with, Chapter 1 will provide a concise update of the situation of the Andean Pact and its individual members. This section will serve the purpose of establishing the global environment in which the CONDOR project was first conceived, discussed and then decided.

Chapter 2 will present the current status of the Andean Pact's satellite infrastructure as well as the history of the subregional integration efforts in telecommunications. In this fashion, possibilities for a rapid deployment of the CONDOR network and assessments of its importance within the so-called "Andean Strategy of Physical Integration,"⁴ will be more easily estimated.

In turn, chapter 3 will address the specifics of the CONDOR project in a detailed historical and descriptive manner, while chapter 4 will introduce and discuss the actual project's adoption criteria.

CHAPTER 1

CONDOR AND THE SUBREGIONAL CONTEXT

The expression Andean subregion is used in this thesis to exclusively refer to those countries which belong to the Cartagena Agreement or Andean Pact: Bolivia, Colombia, Ecuador Peru and Venezuela--see figure 1. Its main difference with the more comprehensive concept of Andean region is that the so-called subregion, defined in political rather than geographical terms, has never included Argentina. In fact, the intention of the Andean Pact nations was, and still is, to consolidate an integration process independent from the more advanced members of the old Latin American Free Trade Association,⁵ namely Argentina, Brazil and Mexico.

Subregional Territory

The Andean subregion covers a total surface of approximately 1.8 million square miles (4.7 million sq. km.), that is, a territorial extension equivalent to one-half of the European continent or the size of the twelve largest states of the U.S. combined. As an economic unit, the subregion is smaller and less populated than Canada, the United States and Brazil within the American continent.

The Andean Pact's communication policy makers feel that, if North Americans, Soviets, Europeans, Brazilians, Mexicans and others found justifiable to build their respective

communication satellite networks, in part because of their territorial dimensions, the Andean subregion is neither different nor in less need for this new technology.

Geographic Patterns

Sharing among themselves a strikingly similar topography, the Andean Pact nations constitute a complex collection of all types of climates and terrains, most notably, high mountains, rainy forests, deep unexplored jungles, deserts, and extensive warm plains. Facing a cordillera with heights of over 15,400 feet in every single member-state, large portions of their national territories are also dominated by the Amazon basin.

Thus, in order to justify their satellite system (as other developing countries have done in the past), the Andean countries sustain that a satellite network of regional coverage is the ideal tool to overcome the domestic and intra-regional communication problems derived from the high mountains and jungles.

On the other hand, at the continental level, the Andean subregion is aware that it enjoys a privileged geographic position. In fact, this area is not only the main entrance to South America and the closest to the Panama Canal but also the most immediate neighbor of economically and/or politically valuable regions like Central America, the Caribbean and the Amazon basin. Furthermore, the subregion has extensive shorelines on the Caribbean sea and the Pacific

and Atlantic oceans, strengthening its strategic importance. For these reasons, Andean Pact officials seem to believe that a considerably well located geographic region like theirs should exercise in essential fields like satellite communications and informatics, greater political autonomy and sovereignty.

Individually, however, Bolivia is one of the most geographically disadvantaged nations of Latin America, being a landlocked state since the early 1870's.⁶ For Bolivia, taking part in a joint satellite venture with culturally and historically close partners, may eventually represent greater opportunities to overcome its geographic isolation. It is not a mere coincidence that the Bolivian government had officially announced its full participation in the CONDOR project, two weeks after negotiations with Chile for a path to the Pacific ocean had once again failed.⁷

Finally, a geographical element of utmost importance for the Andean Pact countries (as will be discussed later), is the fact that two of its members, Colombia and Ecuador, are crossed by the equator. In fact, for the subregional telecommunication authorities, backing up the Equatorial countries' claim of sovereignty over portions of the geostationary orbit (GSO) is nothing less than to defend the CONDOR project itself. Consequently, the Andean network's geostationary orbital positions--located above Ecuador and Colombia--are being coordinated having the alleged Equatorial

countries' rights of sovereignty in mind at all times.

Basic Population Features

The subregional population is currently estimated at 83.5 million inhabitants, distributed in five major racial groups: **mestizos (47%)**, native indians (28%), whites (16%), blacks (5%) and mulattos (4%). By the mid-1990's, the Andean Pact area is expected to have between 105 and 110 million people.⁸

It is important to observe that indians represent at least one-half of the total domestic population in Bolivia and between two-fifths and one-half of those in Peru and Ecuador.⁹ Being CONDOR inspired in social developmental goals connected to the provision of basic human needs in isolated areas (e.g. literacy and medical care), ethnic, cultural and linguistic conditions are destined to shape the implementation of the project. Specially, at the educational programming and other software levels. As a rural satellite experiment in Peru demonstrated:

Projects themselves frequently depart radically from their original programmes and timetables ... when linguistic and cultural differences are not sufficiently taken into account.¹⁰

As a whole, the Andean subregion is twice more urban than rural, even though, on a country by country basis, Bolivia is predominantly rural and Ecuador is only slightly more urban--see figure 2. In sharp contrast, Colombians, Peruvians and Venezuelans are increasingly concentrated in the largest cities. Urban dwellers in these last three nations constitute at least 65% of their total national populations. As one of

the desired effects, Andean telecommunication authorities expect CONDOR to contribute with visible reductions in the migration of peasants to the urban centers.

Basic Cultural Features

Three major languages are widely spoken in the Andean subregion: predominantly Spanish, Quechua and Aymara. Although Spanish is the official language in every Andean republic, Quechua is extensively spoken in Bolivia, Peru and Ecuador. Aymara is also the mother tongue of a considerable number of Bolivian and Peruvian Indians. As a matter of fact, of the 23.5 million Indian inhabitants living throughout the subregion, at least, 10 million speak Quechua and roughly 3 million speak Aymara.¹¹ Therefore, in practice, Spanish is the minority language in Bolivia although the dominant one.

Furthermore, despite big educational improvements during the last two decades, illiteracy is still a major problem in the Andean subregion: approximately 15 million Andeans do not know how to read and write (approx. 18% of the total subregional population).¹² Mixed problems of bilingualism and illiteracy are common among native Indian inhabitants.

Adding to the relative language homogeneity, it is worth mentioning that the Andean subregion is nominally 94% Catholic. In fact, in addition to major legal influences, both the Spanish language and the Roman Catholic Church are the greatest legacies passed on to the Andean countries by the Spaniards in more than 300 years of colonization.

Evidently, the fusion of strong hispanic values and a deeply-rooted Indian heritage have contributed in making the Andean Pact area (at one time, part of the forever famous Inca empire of Tahuantinsuyo¹³), a community with fairly high levels of mutual cultural identity.

Bolivarian Heritage

A rich source of cultural cohesion among the Andean Pact countries is certainly the Bolivarian sentiment. As Clayton wrote, "no figure symbolizes and unifies these nations more than the great South American Liberator Simon Bolivar."¹⁴

Bolivar's life was dedicated not only to the cause of freedom for these nations, but perhaps more devotedly, to their unity and integration. For the Andean hero, common origins, one language, one religion, similar political aspirations, and a need for outside recognition were enough reasons for having an Andean world united as a nation of nations.¹⁵

For the Andean Pact, the regional satellite emerges today as a modern instance of the member-countries' Bolivarian spirit of unity and integration. As Ferreira and Mody noted:

The strength of the Simon Bolivar sentiment is even recognized by commercial transnational business entities such as PANAMSAT, who chose to call their first geostationary communication satellite the "Simon Bolivar."¹⁶

Individual Countries' Economic Profile

Years ago, Carlos Castro, former General Manager of the Ecuadorian Telecommunications Institute (IETEL) wrote:

If a satellite communication system is considered to have a catalytic role in the integration and development of a group of countries, its configuration will be influenced not only by technical and economic but also political and social considerations.¹⁷

In fact, as far as the Andean Pact's economic considerations go, the first half of the 1980's was probably the worse time ever, up to now, to experience the integration process. Despite greater levels of economic diversification and social advancement, the members of the Cartagena Agreement still prove to be heavily dependent on foreign actors and highly vulnerable to external economic pressures.

Due to international market constraints, for instance, Peru's crude oil revenues fell three-fold in just one year. With low market prices hurting badly its mineral exports, the national economy now looks seriously depressed, for Peru is among the world's top five producers of lead, silver and zinc.¹⁸ In Peru (a lower-middle income country), less than one-tenth of the national income is received by 40% of the population with two-thirds of it being appropriated by the top 20%--see figure 3. Different levels of unemployment now affect more than half of the labor force, with inflation reaching an average 95% per-year increase throughout the 1980's. Empirically, this country appears socio-economically behind Venezuela and Colombia, and probably even Ecuador.¹⁹

In 1988, Peru was expected to have in addition to the highest inflation the lowest economic growth rate of the subregion.

Showing even greater economic difficulties than Peru, Bolivia is a "beggar in a throne of gold." Despite huge mineral resources, principally crude oil and tin (its world's leading producer), Bolivia is one of the less developed lower-middle income countries of the world. As in neighboring Peru, major energy and mineral exports have suffered from low international prices. In this Andean state, 36% of the national income is captured by the top 5% while slightly more than 4% of the total country's wealth falls into the hands of the poorest one-fifth of the population.²⁰

During the first half of this decade, Bolivia faced dramatic economic fluctuations with massive currency devaluations and annual average inflation rates of over 1,500%. Today, however, inflation has been controlled and reduced but not without extreme sacrifices in terms of government spending cuts, massive lay-offs and salary freezes. In 1988, the Bolivian economy, however, was expected to grow faster than those of Venezuela and Peru, maintaining the lowest annual inflation rate of the subregion at about 15.5%.²¹

Unlike any other Andean Pact nation, Bolivia receives substantial development assistance from multilateral organizations and individual countries. Between 1982 and 1984, for instance, Bolivia collected \$1.4 billion dollars in

foreign aid primarily from the World Bank and the United States. World Bank contributions alone represented 6.2% of Bolivia's gross national product in 1985.²²

In contrast, for being a country with preferential status within the Andean Pact scheme, Ecuador seems to show more positive overall signs of socio-economic performance. As of 1985, this small Andean country had per capita GNP and Physical Quality of Life (PQLI) index levels higher than those of Peru and Bolivia.²³ Still, recurrent massive devaluations and inflationary pressures have contributed to deepen social and economic disparities in Ecuador. Underemployment remains as high as 50% whereas total wealth continues to be highly unequally distributed: 3% of the national income being received by the bottom 20% as one-fifth of the total national wealth is absorbed by just 3% of the population.²⁴ In 1988, however, this lower-middle income country was expected to have the highest economic growth rate of the subregion.

As an OPEC member, Ecuador is the third largest crude oil exporter of Latin America. Price declines have nonetheless seriously affected the Ecuadorian petroleum industry, to the extent that, in 1986 alone, this Andean state experienced a sharp 50% reduction in export revenues.²⁵

The other OPEC member in the Andean subregion is Venezuela.²⁶ As the second largest petroleum exporter, this Andean nation accounts for one-tenth of the total crude oil

traded worldwide. Despite deep revenue cuts between 1984 and 1986, petroleum still represents about 85% of the total Venezuelan exports. However, progressive and continuous devaluations plus increases in the unemployment rate, are weakening the once comfortable Venezuelan economy. Today, socio-economic disparities are on the rise as almost half of the national income is obtained by one-fifth of the population. Still, Venezuela remains in empirical terms the richest economy of the Andean Pact. Subregional projections for 1988, however, predict that this oil-rich member will have the second lowest economic growth rate of the Andean Pact area.²⁷

As the only upper middle-income country of the Andean subregion and due to the oil boom of the 1970's, Venezuela used to provide considerable development assistance to various Latin American countries including other Andean Pact members. For instance, between 1974 and 1981, this country released \$453 million dollars in aid to Bolivia and Peru. In the case of Bolivia, advising expert time was provided for the operation of the Tiahuanaco satellite earth station and the Bolivian international telephone network. Current financial and oil market constraints, however, are likely to greatly undermine or completely wipe out such previous Venezuelan economic generosity.²⁸

If Venezuela owes its modern development to oil, Colombia owes it mostly to coffee bonanzas. By the 1920's, this Andean

nation was already the world's leading exporter of mild coffee and second largest producer after Brazil. Recently, however, abundant oil deposits discovered close to the Venezuelan border are gradually putting petroleum extraction at the top of the Colombian economy. A steep 70% oil production growth rate in 1986 shows the renewed economic importance of this item.²⁹

With less abrupt inflation rates (22% throughout is present decade) and no records of massive devaluations in several years, Colombia is seen as having the most steady economy of the Andean subregion in the 80's. In 1988, Colombia was expected to show the second highest annual growth rate and the second lowest inflation of the subregional area. Today, however, 60% of the Colombian labor force is earning below the minimum wage. As in Ecuador, extremely high concentration of wealth continues to be a major problem in Colombia with two-thirds of the national income being received by just the top 10% of the population.³⁰

In sum, all Andean Pact countries face similar economic dilemmas. In addition to the extreme internal socio-economic inequalities, each Andean republic experiences a strong dependence for revenue on few export-products (most notably, crude oil at the subregional level). Also, not fully developed Andean industry structures impede greater levels of domestic import substitution, while balance of payment

deficits and huge external debt bills raise themselves as a major cause of the present domestic and subregional economic stagnation.

In the same token, frequent currency instabilities, permanent inflation pressures and high unemployment and underemployment rates, put these five nations under the same umbrella of social underdevelopment: misery for the very many and abundance for the very few.

Because of these socio-economic conditions, the Andean Pact countries are most likely to encounter major obstacles to finance the CONDOR network; a prominent one would be the difficulty to obtain the required foreign exchange, due to their external financial constraints as well as their weakened and unstable export sectors.³¹ When asked about whether or not the Andean countries could afford the expenses connected to a regional communications satellite, a top Andean telecommunication official responded:

I understand that in a given moment, due to reasons of economic priority, it may be difficult to utilize certain resources. However, it is already common [in this type of projects] to resort on international financing, which, when appropriately negotiated, can allow reasonable long-term disbursements to be covered with the system's income.³²

Indisputably, the economic situation of every Andean Pact republic is highly complex, yet, possibilities of obtaining financing abroad based on their respective natural, human and industrial resources are not all hopeless (something that appears to be particularly true for countries like Venezuela

and Colombia, and in much less extent, Ecuador and Peru).

Here, it is important to note that the chief intention of the Andean Pact nations in this joint satellite venture is precisely to pull resources and efforts together, so that the costs involved may be shared in accordance to their particular individual possibilities. Still, financial burdens derived from the execution of the project seem too heavy for some countries, like Bolivia for instance.

Behind the Debt Shadow

There is little doubt that the trauma of the Andean Pact economies is best expressed in the fact that every single member is listed as one of the seventeen highly indebted nations of the world.³³ For this group of countries, the external debt problem is certainly the major constraint in drawing outside funds for high investment projects like CONDOR. As a Peruvian minister once asserted, "the foreign debt is the main obstacle preventing the Andean Pact from having the necessary resources for its development."³⁴

As of 1986, Venezuela was the biggest debtor with \$35.9 billion dollars of total external debt. Beginning the second half of this decade, every Venezuelan was born owing \$2,019 dollars to foreign banks (the highest per capita debt rate of the Andean subregion). After debt increases of slightly more than 50% per year since 1976, Venezuela found itself having to spend two-fifths of its total exports just to cope with foreign public-debt service obligations.³⁵

In the meantime, Colombia was already the second most indebted nation of the subregion: \$14.8 billion dollars. Although Colombia had managed to fractionally meet its foreign debt (being the only country in Latin America not having to reschedule it), this nation would still be forced to use nearly almost one-third of its total exports in public debt-service payments. Colombia, however, has the lowest per capita external debt of the Andean subregion (\$504 dollars in 1986).³⁶

With a substantially less productive domestic economy, Peru's external debt is similar to that of Colombia. By lending \$14.5 billion dollars, Peru owes the equivalent of two-thirds of its GNP. In 1986, as a matter of government policy, public debt service payments were being held at about 16.5% of the total Peruvian exports.³⁷

In Ecuador, the debt crisis is perhaps the most critical after Venezuela. With \$8.2 billion dollars of total external debt (75% of GNP), Ecuador presents the second highest per capita debt rate of the subregional area. In fact, the external debt problem would push Ecuador to use as much as two-thirds of its total export revenues in order to attain the foreign public debt-service payment schedule.³⁸

Finally, although nominally Bolivia had the lowest total external debt of the Andean subregion (only \$5 billion dollars), such amount is equivalent to 91.5% of this country's GNP. Similarly to Peru, Bolivia was expected to use

16% of its total export revenues in public debt service commitments.³⁹

Subregional Economy

The Cartagena Agreement began to obviously reflect the economic crises of its individual members by the early 1980's. After years of operation in a relatively favorable commercial environment, increasing protectionism in international markets and internal economic difficulties forced the Andean Pact countries to also restrict their imports inside the subregion.

In less than five years, a decade of continuous achievements in intra-subregional trade (up to \$1.3 billion dollars) was cut in half. By the time economic growth rates started falling, higher levels of unemployment, external debt, inflation and fiscal deficits signalled the arrival of an imminent subregional economic decay. Persistent failures in meeting key economic plans such as the implementation of a common external tariff, the harmonization of economic policies, and the promotion and execution of important subregional industrial programs, urged Andean Pact authorities to come up with formulas of economic reactivation.

Beginning with an Andean presidential summit in 1983, the Andean Pact countries initiated a process of negotiations for a reorientation plan intended to redefine existing subregional economic strategies. On May 12, 1987, the

Comision⁴⁰ passed the "Modifying Protocol of the Cartagena Agreement." Among other reforms, this document called for greater levels of participation of the private sector and complete individual members' flexibility to determine their own foreign investment policies. All these, in the idea of adjusting the subregion to the new national and international economic conditions.⁴¹

In spite of the crisis, the Andean Pact countries still see themselves as the fifth largest market of the Third World after China, India, Brazil and Mexico (all of these countries with operational and/or considerably developed satellite systems). In 1986, the Andean Pact constituted an economic unit of \$105 billion dollars of gross national product, 18% of which came from exports.⁴²

The most frequent question is, however, how can an economically weakened integration process assure the survival of a major multilateral enterprise like CONDOR? Andean telecommunication representatives respond to it by saying that, even though the common market is going through difficult times in trade terms, many other areas of the subregional scheme are progressing with much less difficulty; reaching, in some cases, notable achievements for all members, as in the case of the completion of the Andean microwave network in the field of telecommunications.⁴³ As Sergio Martinez, General Secretary of the Colombian Ministry of Communications observed, even though the economic and

political atmosphere of the Andean Pact is not the ideal one, the Group's determination around the CONDOR project is more than evident.⁴⁴

Domestic Politics

Throughout these last two decades, the political environment of the Andean subregion has been shaped by combinations of four main determinant factors: traditional bipartisanship, guerrilla movements, military governments and illegal drug-trafficking.

In fact, thanks to tight bipartisan political controls during the last thirty years, the more stable, "relative democracies" of the subregional area like Colombia and Venezuela have been able to stay free from military takeovers. In Colombia, for instance, since the end of the Rojas Pinilla's military dictatorship in 1957,⁴⁵ the Liberal and Conservative parties have fabricated all sort of political cartels to hold power (e.g. a 16-year-long National Front between 1958 and 1974, in which both traditional parties switched presidents every four years). The current Virgilio Barco's administration is actually the first one not sharing government posts with the other traditional party in opposition.

After conciliating the old hatreds of La Violencia,⁴⁶ political dynamics in Colombia have been reduced to faction disputes inside and between the Liberal and Conservative parties. If meaningful differences exist, they are in terms

of the constituent economic interests each party tries to protect. Today, despite a recent electoral progress of the Communist Party-led Union Patriótica, conservatives and liberals remain virtually unchallenged.

Similarly, in Venezuela, political supremacy have been in the hands of two major traditional parties: **Accion Democratica (AD)** and the **Comite de Organizacion Politica Electoral Independiente (COPEI)**.⁴⁷ With the collapse of Perez Jimenez's dictatorship by the late 1950's,⁴⁸ Venezuela began a gradual slow process of diminished political antagonism between AD and COPEI. Today, in the midst of mellowed nationalistic and populist positions, a two-party system with no major opposition (similar to Colombia's bipartisan fashion) has apparently decanted in Venezuela. A transitory period of increased political competitiveness experienced since the arrival of the left-wing **Movimiento al Socialismo (MAS)**, fell as quickly as it rose. By the mid-1980's, MAS had lost its momentum, leaving the power of both traditional parties once again unquestioned.

Generally speaking, specially at government levels, traditional parties in both Venezuela and Colombia have shown their support for the CONDOR project during this decade. Major challenges against the regional satellite in either country is not immediately foreseen. Even less, when Colombia is the pioneer in the struggle for rights of sovereignty over the Equatorial segments of the geostationary orbit, and any

position against such a long hoped national aspiration would then be taken as a political treason to the nation. As far as Venezuela is concerned, any major resistance is also unlikely, especially now that this country has obtained the headquarters of the Andean satellite organization after considerable regional lobbying.

Unlike Colombia and Venezuela, traditional bipartisan strategies have not worked in Peru, Ecuador or Bolivia. Although traces of political traditionalism remain, contemporary domestic politics in each of these Andean countries has fostered new actors, predominantly the military.

In Ecuador, for instance, before World War II and until the early 70's, there was a completely different type of bipartisanism: Velasquismo⁴⁹ versus militarism. Four times out of five, the military overthrew Jose Maria Velasco Ibarra from the presidency. The only occasion in which this office was peacefully transferred was during the 1950's when Ecuador had a transitory democratic period of slightly more than a decade. It was precisely during this time when the two traditional parties, the Conservative and the Radical Liberal, elected their respective candidates to the presidential office (suggesting--perhaps not surprisingly--that in the Bolivarian countries, traditional bipartisanism has been usually associated to higher though rather unpopular levels of political stability).

After Velasco's death in the late 70's, Ecuadorian politics opened up significantly. Ever since, merged in frequently unpredictable coalitions, numerous political organizations from the far right to the far left have been competing for the Ecuadorian presidency every four years. Demonstrating a somewhat more dynamic political-debate environment, Ecuador jumped in few presidential terms from the popular Roldos' nationalistic and anti-U.S. presidential period to the pro-Reagan Febres' conservative administration. Just recently and interestingly enough, after 17 years of not visiting South America, Fidel Castro came to Ecuador for the possession of its new president Rodrigo Borja.⁵⁰

As in Colombia, in Ecuador major political parties appear to be supportive of the Equatorial countries' claim of sovereignty over their national space. Therefore, substantial opposition against the CONDOR project coming out of this country also seems very unlikely.

As in Ecuador, Bolivia's military has been either front stage or behind curtains in each relevant political event. With 192 military coups in 162 years of republican life, Bolivia used to be the cause of frustration for not having, at least, in a formal sense, political "democracy" throughout the Andean subregion.

In October of 1982, however, particularly after the downfall of the corrupt Garcia Meza's military Junta (deeply involved in the traffic of narcotics), Bolivians entered for

the first time since the creation of the Andean Pact into a clear period of political democratization.

Bolivia is now governed by the three-times president Victor Paz Estenssoro, leader of the traditional **Movimiento Nacionalista Revolucionario (MNR)**.⁵¹ In 1952, Paz Estenssoro and the also three-times president Hernan Siles Suazo headed an isolated but historical movement: the Revolution of 1952 (frequently compared in scope and intensity to the Mexican and Cuban revolutions).⁵² The revolt came as the most fundamental change ever attempted in the Bolivarian world. In 1982, after several elections, Siles Suazo was made again president; but this time representing a socialist-communist coalition, the **Unidad Democratica y Popular (UDP)**.⁵³ In this way, Siles Suazo became the second socialist president ever brought to office by popular vote in the Latin American continent.

Because of this quite varied political evolution, Bolivia is, in theory, the nation with the broadest ideological-movement spectrum of the Andean subregion. Yet, increasing political polarization, as well as power ambitions among the armed forces make Bolivia highly susceptible to sudden military and paramilitary takeovers. Hence, in few words, political support for expensive alternatives like the CONDOR project, may eventually run the risk of either coming under fire or being totally withdrawn by a new government opposed to the idea of a regional satellite. Although, so far, since

the CONDOR's creation, political expressions of support for the satellite project has been officially made by military and non-military as well as left-wing and right-wing administrations.

In Peru, the military has also been an influential force whether blocking or promoting change. In 1968, a group of high military officials commanded by Gen. Juan Velasco Alvarado inaugurated the Peruvian Institutional Revolution with a military regime based on firm anti-oligarchical and pro-Third World stands. After the 1952 Bolivian uprising, the military-commanded Peruvian revolution has been the most serious attempt at structural change ever tried in the Andean subregion. The social military revolution, however, slowly weakened having to renounce to its power in 1980.

Support for the regional satellite project can be easily traced to the times of the military control during the 1970's, even though the greatest boost in favor of the project came from the civilian Peruvian governments of the 1980's, specially after this country's proposal of reviving CONDOR in 1982. Thus, political opposition against the Andean satellite in Peru is not readily foreseen either.

Guerrilla and Drugs

Guerrilla movements became an influential factor in Andean Politics primarily after the triumph of the Cuban revolution. Also, Ernesto "Che" Guevara's execution in Bolivia, in 1967, greatly contributed to fuel the guerrilla fervor throughout

the Andean world.

For years, small guerrilla redoubts in Bolivia, Venezuela and Ecuador survived the official anti-guerrilla warfare, until finally they practically vanished. On the contrary, in Peru and specially Colombia, guerrillas gained in strength becoming a major threat to the status quo. Although differing in ideological stands (some pro-Moscow and other pro-Beijing), marxist guerrillas in those two Andean countries are primarily rural, widespread and with considerable popular support in their multiple areas of operation.⁵⁴

In spite of several political amnesties (some more flexible than others), guerrilla groups continue to keep on their military struggle for power in Colombia and Peru. Conversely, an increasing number of neo-fascist paramilitary death squads have made their way with massive killings of progressive and left-wing opposition leaders, as well as, of peasants being accused of protecting the guerrillas.

Such internal political unrest might have had a lot to do with not having the headquarters of the Andean satellite organization in either Colombia or Peru (both countries widely recognized as those with the greatest experience in satellite communication related-activities inside the subregion). In fact, in the case of Peru, a rural satellite project carried out by the government with assistance of the U.S Agency for International Development (USAID) in the Amazons, reported having experienced multiple complications

as a result of intermittent guerrilla assaults. Likewise, heavy dependence of certain zones on the cocaine industry was also identified as a major source of numerous project difficulties.⁵⁵

Since the early 1970's, the drug mafia (at times, apparently associated with guerrilla fronts) have become an even bigger problem. Encouraged by the extremely profitable and rather uncontrolled demand from the United States and Western European countries, the Andean Pact area has grown into the supply center of illegal drugs like cocaine, "crack" and, in the past, marijuana. Despite clear government efforts to eradicate and dismantle drug cartels, every day killings of high public officials, politicians, judges, enforcement officers and private citizens continue to add to the quota of violence in the Andean Pact community.

Today, a political and socio-economic corruption, nourished by the buying power of drug dealers, is already a widespread phenomenon in the Andean republics (most notably in Bolivia, Colombia and Peru). More recently, as part of the need for worldwide strategies to fight against illegal drugs, the Andean Pact has called for the implementation of subregional policies to try to hold back the massive production and traffic of narcotics.⁵⁶

Consequently, for each member-country, the CONDOR project has a strong national security appeal tied to the war against drug-related mafia and guerrilla groups (which operate

primarily in distant isolated zones). Andean enforcement agencies and military authorities are apparently encouraged by the great potential of satellites to detect illegal drug and guerrilla operation centers.

In fact, on December 9, 1987, Colombian newspapers widely publicized a successful combined operation of U.S. and Colombian narcotics intelligence agencies in locating and dismantling one of the largest clandestine cocaine laboratories ever found in the Amazon jungle. Such illegal drug factory was found by tracing satellite signals sent from tiny transmitters hidden in barrels of ether sold in the U.S.⁵⁷

Here, it is worth noting that occasional speculations dealing with the potential risk of having an Andean regional satellite system entirely or partially financed with moneys received from drug cartels (sometimes hilariously referred as "NARCOSAT"), is simply an absurd possibility. With such strong national security agenda of the Andean Pact governments, drug dealers would be little interested in facilitating the monitoring of its safest zones: the jungles and other difficult access areas.

Subregional Politics

For the Andean Pact, 1982 was the first time in thirteen years in which every single member-country had a democratically elected president. By 1985, nonetheless, subregional authorities were crying for greater political

support from member states. Currently, based upon the recent ratification of the already mentioned Modifying Protocol, the highest officials of the Cartagena Agreement believe that the political crisis of the Andean Pact has been once again overcome (at least, temporarily).⁵⁸

In addition to the politico-institutional crises, the Andean Pact has gone over the years through difficult times in intra-subregional relations. For example, as side effects of the last century War of the Pacific, Bolivia and Peru have become increasingly sensitive to their border disputes not only against Chile but even between themselves. Bolivians apparently believe that Peru has not been all that collaborative in helping Bolivia obtain the badly needed *salida al mar*.⁵⁹ Meanwhile, Peru--particularly the military--fears an eventual loss of additional territory if they engage in any conciliatory negotiations.

In the same token, Peru has old territorial disputes over the Amazons with both Colombia and Ecuador. As for the Colombian-Peruvian differences, Peru still feels territorially deprived from the results of the Lozano-Solomon Treaty signed in Rio de Janeiro in 1934. In this agreement, Colombia retained sovereignty over disputed territories located on the Northern edge of the Amazon river. More recently, border conflicts between Peru and Ecuador broke into an armed confrontation in January 1981. Although the skirmishes were stopped in a matter of a few days, big

tensions remain alive. In turn, Ecuador also has border complaints with Colombia over the Amazons.

Finally, Colombia and Venezuela have developed high levels of mutual resentment around the issue of the marine and insular sovereignty over surroundings of the Maracaibo gulf. Little progress has been made in this area in spite of considerable bilateral negotiations (which now have prospects of being resumed under the Carlos Andres Perez' Venezuelan presidency). Not infrequently, tensions are revived by both harassment of Colombian citizens living in Venezuela and Colombian guerrilla incursions into Venezuelan lands. On few occasions, troop movements along their respective borders have put these two countries in clear danger of an eventual military encounter.

It is not less true, however, that border disputes have been regularly used in every Andean Pact nation as a political tool to raise chauvinistic passions, and therefore, increase popular support during presidential elections. Yet, border disputes still have great potential for disrupting the activities of the Andean Pact, as briefly occurred immediately after the Ecuadorian-Peruvian armed conflict in 1981. Eventually, more serious conflicts could paralyze all activities of the Pact (or even destroy it), completely frustrating the CONDOR project. Thus far, however, diplomatic invocations to the Bolivarian spirit of unity and friendship have been the most frequent result out of these border

tensions.

Early this decade, threats of withdrawing from the Andean Pact came from both Colombia and Ecuador, while in Bolivia, the benefits of participating in the integration process was being seriously questioned. Paradoxically, nonetheless, Chile was also announcing its interest to re-join the subregional integration scheme. In the end, the Andean Pact stayed as it was, saving its political crisis by means of the five-member negotiation on the Modifying Protocol of the Cartagena Agreement. Then, as for now, the danger of near future withdrawals have faded out.

In sum, in analyzing the global situation of the Andean subregion, this first chapter has identified contextual elements that tend to foster the implementation of the CONDOR project. Namely, equivalent geographic and population characteristics (e.g. rural isolation, complex topography and difficult access zones); common socio-cultural and historical features (e.g. strong sense of unity and integration, almost identical cultural and historical roots, comparable rural development needs, and practically the same language); and finally, similar domestic and subregional political interests (e.g. shared national security and international sovereignty concerns, and an apparent widespread internal political support for the project).

Conversely, however, other contextual forces seem to pull back the final realization of the project. Basically, weak

domestic and subregional economic conditions (e.g. diminished export revenues, poor economic performance, deep socio-economic disparities, and depressed intra-subregional trade flows), huge external debt levels, and notorious political weaknesses within the Andean Pact (e.g. unsolved animosities, and the risk of an eventual decay of the integration process).

CHAPTER 2

SUBREGIONAL TELECOMMUNICATIONS INFRASTRUCTURE AND INTEGRATION

In theory, telecommunications integration in the Andean subregion, particularly in the area of satellite communications, began the same day the Cartagena Agreement was signed. In practice, however, specific attempts at this type of subregional cooperation were not initiated until eight months later.

On May 26, 1969, art. 86 of the Cartagena Agreement mandated the following:

Member countries will undertake a joint action in order to solve infrastructure problems that unfavorably impinge on the economic integration process of the subregion. This action will be principally exercised in the fields of energy, transportation and telecommunications ...⁶⁰

Subregional Telecommunications Infrastructure

Beginning the second half of the 1980's, the Andean Pact presented an average telephone density of approximately 5.2 lines per every 100 inhabitants--see figure 4. Ranging from as low as 2.6 telephones per hundred in Bolivia to as high as 9.4 in Venezuela, Colombia was found to have telephone availability rates similar to the latter (8.2) while Peru and Ecuador had access levels closer to the former (2.7 and 3.4, respectively).⁶¹

In general, the Andean Pact showed average telephone density marks equivalent to less than half of those existing

in Costa Rica, Panama and Argentina, countries with the highest telephone per-hundred-ratios in Latin America.⁶²

Within the subregional context, Venezuela and Colombia are putting more emphasis towards improving their telecommunications infrastructures. For example, of the total telephone equipment imported by the Andean Pact between 1981 and 1985, approximately 60% went to Colombia and 20% to Venezuela. Similarly, external expenditures in telephony during this period were greater in Colombia and Venezuela (\$183 dollars per thousand inhabitants) than in the rest of the Andean republics (\$139, \$40 and \$24 dollars in Ecuador, Peru, and Bolivia, respectively).⁶³

Supply shortages of telephone lines in every single member-country continues to be a common case however. As of 1986, Venezuela and Ecuador had as much as 40% of their respective telephone demands completely unmet. Thus, determined to expand and modernize their telephone networks, nations of the Cartagena Agreement spent \$557 million dollars during the first half of this decade in just telephone equipment.⁶⁴ As Aguilera pointed out, for the Andean Pact, this figure was "twice as greater than the total amount invested in the subregion [in telecommunications] since the times of Samuel Morse."⁶⁵

Similarly, there are considerable disparities among the Andean Pact countries in terms of radio and television availability. Whereas Bolivia shows a high ratio of 57.5

radio sets per hundred (among the highest in the Third World), Colombia and Peru have radio access levels as low as 16.6. And, while Venezuela presents the highest rate of television sets of the subregion (12.8), Ecuador has the lowest with only 6.1 TV receivers per every 100 inhabitants.⁶⁶ As a whole, however, the Andean community has average ratios of 32.8 radio receivers and 8.0 television sets per hundred, which means that, comparatively, the Andean subregion has higher radio availability levels than Mexico, slightly lower than Brazil, and considerably lower than Argentina. Although, in television terms, set ownership is smaller in the Andean area than in each one of these three major Latin American nations.

As far as other telecommunication technologies go, particularly data communications and informatics, the Andean countries are merely in their early stages of development. Yet, their adoption seems to be progressing quite rapidly.

Even though every Andean domestic telecommunication enterprise is planning to set up some sort of operational data communication service in the near future, the relatively most advanced in their actual implementation are CANTV-Venezuela, TELECOM-Colombia and ENTEL-Peru. By the mid-1980's, for instance, CANTV's data network had approximately 3100 public and private subscribers, while TELECOM's COLDAPAQ system was just trying to start with approximately 100 clients. CANTV and ENTEL-Peru were also expecting to have, by

the end of this decade, close to 11,000 and 700 subscribers, respectively.⁶⁷ In the meantime, ENTEL-Bolivia and IETEL-Ecuador were simply involved in pilot projects with marginal operations in this field.

Other domestic governmental projects in informatics such as the Venezuelan CONICIT's Sistema Automatizado de Informacion Cientifica y Tecnologica (SAYCIT)⁶⁸, and SENAIN's informatics project for education in Peru, were also making some progress.⁶⁹

More recently, a subregional accord among nine private Peruvian centers and non-governmental development organizations agreed to create an Andean Information network to standardize and intercommunicate their information systems. Research centers from Bolivia, Colombia and Ecuador also showed their interest in joining this network.⁷⁰

Aside from ASETA's SATEL plan (to be explained later), the most important project of informatics at the Andean Pact level is the Sistema de Informacion Tecnologica (SAIT),⁷¹ administered by the Board of the Cartagena Agreement. SAIT currently operates a subregional information network with data on foreign investment, international prices, technology transfer, industrial property, patent registration, and few other types of industrial and technological information.⁷² This system used to operate manually, but now it is being slowly computerized with the installation of microcomputer terminals in each Andean capital.

Current estimates have calculated the computer density of the Andean Pact region at 1.2 units--mainly PCs--per every 1,000 inhabitants. Bolivia appears to have the lowest rate (0.47 personal computers per thousand) and Venezuela the highest (3.18), distantly followed by Colombia (0.84), Peru (0.61) and Ecuador (0.59).⁷³

Of the five members, Venezuela and Peru are the only ones with some domestic manufacturing of computers. In fact, Venezuela supplies 18% of its national market and both countries even export modest amounts (e.g. Peru to the Eastern Bloc).⁷⁴ On the contrary, between 1981 and 1985, the Andean group imported 2.04 billion dollars of informatics and telecommunication related products, 1.1 billion of which were paid to U.S. multinationals.⁷⁵

In terms of cable television, Colombia and Peru are the only ones in the subregion having operational systems--although they seem to be really multipoint distribution services (MDS) rather than truly cable TV services. The Peruvian TVS network in the Amazon city of Iquitos has already 2,000 subscribers while the first system in Bogota, Colombia, was just entering the market in December of 1987. Some de-facto systems, however, had been operating in Medellin and Barranquilla until the Colombian Ministry of Communications decided to step in with substantial regulations blocking their unofficial operations.⁷⁶

Andean Satellite Facilities

Satellite technology began to be introduced in the Andean Pact area during the late 60's and early 70's. Peru was the first member-country to adopt a satellite earth station: the international antenna of Lurin-1, in July 1969--see figure 5.

Immediately after, Colombia and Venezuela followed suit acquiring their respective standard A antennas--see figures 6, 7. Colombia's Choconta-1 station was installed in March 1970, and Venezuela's Camatagua-1 was built in November of that same year. Ecuador followed the trend buying its high-traffic earth station of Quito in 1972, and finally, Bolivia entered the world of satellite communications building its Tiahuanaco standard A antenna in 1980--see figure 8.⁷⁷ Most of these ground stations were set up with technical assistance of the U.S. Communications Satellite Corporation (COMSAT), being built in the surroundings of each Andean capital.

As of 1987, Colombia had 2 standard A ground stations to handle its international traffic (Choconta-1 and Choconta-3) and, at least, 15 standard Z operational antennas for domestic services.⁷⁸ Contracts were being awarded for the installation of four additional domestic stations: Quibdo, Tumaco, Puerto Asis and San Jose del Guaviare. Construction and equipment supplies for these antennas have been granted, among others, to foreign multinationals such as the American ITT Space Communications (Choconta-1), the French entity

TELESPACE (Choconta-3), and the Japanese Nippon Electronic Company (NEC--several domestic antennas).⁷⁹

Peru also operates two standard A international earth stations (Lurin-1 and Miguel Colina) and no less than 10 standard B and Z antennas for domestic services throughout the country.⁸⁰ Plans were being made for the acquisition of two additional domestic stations in the countryside (Andoas and Chavez Valdivia). Equipment supplies and technical expertise for the construction of some of these satellite facilities were contracted with NEC (Lurin-1), French multinationals (several domestic stations), and the U.S. Harris Corporation (Juanjui, Saposoa and Tocache). These last three are part of the AID/ENTEL-Peru rural satellite project taking place in the Amazon region.⁸¹

On June 19, 1987, Venezuela added to its international satellite network two standard D satellite antennas (Luepa and Santa Elena). The Camatagua telecommunications center was already composed of two international standard A earth stations (Camatagua-1 and Camatagua-2), one international standard B (Camatagua-4), and a domestic standard Z (Camatagua-3). A third standard A antenna for international communications, Camatagua-5, was being scheduled for 1988.⁸² In addition, Venezuela reported to have in operation, at least, three TVRO standard Z antennas: Puerto Ayacucho, San Fernando de Apure, and San Telmo. The very first Venezuelan satellite antenna was installed by the American General

Telephone & Electronics Corp-GTE.⁸³

The remaining two Andean Pact republics were also planning to acquire new satellite stations. Ecuador, for instance, announced the installation of two additional international antennas for 1988: a second standard A in Guayaquil and a standard B in the Galapagos archipelago. Likewise, Bolivia was undertaking feasibility studies for five domestic earth stations to be connected with the existing one at Tiahuanaco.⁸⁴

By 1981, all Andean Pact nations belonged, as user members, to the International Telecommunications Satellite Organization (INTELSAT) where they now hold, altogether, 3% of its total capital. Interestingly enough, this percentage is equivalent to the total Brazilian investment in this multilateral consortium, the largest contribution so far made by a single developing country in this intergovernmental organization.⁸⁵

Therefore, all earth stations of the subregional area are linked to INTELSAT satellites, with the exception of those few connected to the INMARSAT consortium (e.g. Colombia has a new antenna in the Caribbean coast linked to INMARSAT, after this country obtained membership in December of 1985).

More importantly, however, of the five Andean Pact nations, Colombia, Peru and Venezuela are also domestically served by INTELSAT. In fact, in July 1978, Colombia began leasing a 1/4 transponder with the purpose of integrating the

San Andres archipelago to its domestic telecommunications. By 1981, this country was already waiting for the INTELSAT's approval to rent 1 1/4 transponders in the global beam mode.

Similarly, Peru initiated its respective domestic satellite leases in June 1981 beginning with both a 1/4 global-beam and a 1/4 hemispheric-beam transponders. By 1987, Peru announced to have leased two full transponders from INTELSAT, a decision heavily criticized at the time when compared to previous alternative offers made by BRAZILSAT. In fact, opposers argued that renting space capacity from INTELSAT was a bad negotiation, not only for its high price and ground segment costs but also for the short life-span of the transponders rented.⁸⁶

Finally, Venezuela joined the list of domestic leasers in 1982 renting two hemispheric transponders for the nationwide transmission of public television, rural telephony and data communication signals.⁸⁷

The Bolivarian countries feel that the Andean subregion will in a short period of time become an increasingly important user of satellite capacity, with considerable experience and knowledge in terms of the operation, utilization and maintenance of a satellite ground segment. Because of that, the Andean administrations are convinced that greater subregional efforts in satellite communication programs of their own are, on the one hand, a pressing need, and on the other, beneficial for their future

telecommunications.

Early Subregional Telecommunications Integration

With the creation of the Convenio Andres Bello⁸⁸ on January 31, 1970, the Andean Pact countries vowed to commit more efforts and resources towards the improvement of their mutual communications. By giving greater attention to the telecommunications and mass media sectors in each member country, these countries hoped to increase the subregional flow of news and information, entertainment, and cultural and educational programming.⁸⁹

Based on what they believe are the immanent educational properties and responsibilities of the telecommunication media, the Andres Bello Covenant prescribed that the subregion shall:

Joint efforts to carry out, with cooperation from international organizations and other countries, feasibility studies on education via satellite within the signatory countries. If these studies are positive, the signatory countries will undertake actions towards its realization.⁹⁰

The SERLA Project

As part of the Covenant's adoption process, the First meeting of Andean Ministers of Education decided to commission Venezuela with carrying out a feasibility study for the use of satellites in the exchange of educational, scientific and cultural programs throughout the Andean subregion.

In this way, the Sistema de Educacion Regional Latinoamericana (SERLA),⁹¹ as the project came to be known,

emerged as not only one of the first regional satellite initiatives in Latin America but certainly the most significant antecedent of the CONDOR project. Joining the Andean Pact countries in SERLA were Argentina, Paraguay and Uruguay.

There is little doubt that this project came about as a reaction to the U.S. attempts of implanting a satellite tele-education system in South America during the late 1960's. In fact, in June 1967, Stanford University was already involved in implementing a study named ASCEND,⁹² dealing with the possibility of using satellites for education in Latin America. Gathered in Santiago, Chile, in April 1969, representatives of U.S. multinationals (principally, Hughes Aircraft Co. and General Electric International), American universities (e.g. Harvard and Stanford), and the Communications Satellite Corporation (COMSAT), founded the so-called Centro Audio-Visual Internacional Via Satellite (CAVISAT), in conjunction with delegates of some Latin American universities.⁹³ CAVISAT wanted both to broadcast educational programs via-satellite into Latin America and grant academic degrees to Latin American students in their home countries.

The signatories of the Andres Bello Covenant instantly opposed the project arguing that it represented a direct threat to the educational and cultural sovereignty of their nations. As a Colombian delegate once put it in a Latin

American education forum in those days:

Consortia, foundations and universities of the United States prepare educational programs via satellite with Latin America as destination, in order to foster her intellectual and political colonialism.⁹⁴

In conducting SERLA's feasibility study, Venezuela contacted for technical assistance international organizations such as the ITU, UNESCO, the United Nations Development Program (UNDP) and the OAS' Conferencia Interamericana de Telecomunicaciones-CITEL.⁹⁵ UNESCO, for instance, had already published a report entitled "South America, Preparatory Study of the Use of Satellite Communication for Education and National Development," before Venezuela even contacted her.

As in most UNESCO studies of that time, satellite communications at domestic and regional levels were being recommended (rather enthusiastically) as an important tool of integration, education and greater cultural exchange.⁹⁶ Along with ITU, UNESCO presented in February 1971 a regional satellite system proposal to the II Meeting of Andean Ministers of Education of the Andres Bello organization. At this meeting, the Andean Pact countries approved the so-called UNESCO's Operation Plan.⁹⁷

After five summits of the Andres Bello scheme, however, the project was being discussed in an increasingly hostile atmosphere, even though a final feasibility study was officially released in March of 1973.⁹⁸ Yet, during the II Meeting of the Tele-education Regional Committee in Caracas,

Venezuela, on November 26, 1977, SERLA was indefinitely postponed. The participant countries found that the satellite plan was too expensive and also politically cumbersome, as governments could not agree on general content guidelines for the educational materials to be broadcasted.⁹⁹

SERLA, nevertheless, taught the Andean Pact countries two important lessons. First, that a multilateral educational satellite plan is an extremely complex and politically sensitive matter. And secondly--perhaps more importantly--that if the Andean Pact countries do not come up with their own satellite network to serve the subregion, sooner than later, outside actors would do it for them.

In fact, by the early 1970's, three major foreign satellite projects covering the subregion were already on the table: the CAVISAT initiative; another U.S. government-sponsored plan known as the PAGE ENGINEERS project (recommended to president Richard Nixon as a satellite system to be attached to the White House's Office of the Press and Propaganda); and finally, the Italian TELESPIAZIO's satellite project for South America.¹⁰⁰

ASETA's Integration Efforts

In January and May, 1974, two meetings of Andean experts of communications and transportation held in Colombia, discussed the need for the formation of a subregional telecommunication entity. Soon after, the creation of the **Asociacion de Empresas Estatales de Telecomunicaciones del**

Acuerdo Subregional Andino (ASETA)¹⁰¹ came to be officially announced. On May 15, 1974, the I Meeting of Andean Ministers of Transportation and Public Works--the highest communication authority of the Andean Pact--ordered its enactment.¹⁰²

Headquartered in Quito, Ecuador, ASETA emerged as a multilateral office responsible for studying, recommending, coordinating and executing important telecommunication projects of subregional scope. More specifically, ASETA was charged with the task of promoting information exchange and technical and administrative cooperation in telecommunications among its constituent members. In addition, ASETA was expected to help the Andean Pact countries to improve their negotiating position in the world's telecommunications markets: for example, by creating subregional blocks when bargaining for telecommunication equipment abroad. Also, promoting economic and efficient public telecommunication services in the subregion as well as reaching unified Andean positions in international telecommunication fora were set as major ASETA duties.

For these purposes, ASETA's Directive Board was then formed by the general managers (or personal representatives) of each Andean national Telecommunication enterprise, that is, the **Empresa Nacional de Telecomunicaciones de Bolivia** (ENTEL-Bolivia), the **Empresa Nacional de Telecomunicaciones de Colombia** (TELECOM), the **Instituto Ecuatoriano de Telecomunicaciones** (IETEL), the **Empresa Nacional de**

Telecomunicaciones del Peru (ENTEL-Peru), and the Compania Anonima de Telefonos de Venezuela (CANTV).¹⁰³ With a relatively small staff and tight annual operating budgets, ASETA started to advance in the implementation and conclusion of important subregional integration projects in telecommunications (most notably, the Andean microwave network).

Looking at policy guidelines provided by the Andean meetings of Ministers of Transportation, Communications and Public works, ASETA has focused its attention in four major fronts:

First, the **Sistema Andino de Telecomunicaciones-SAT** (Andean Telecommunications System), primarily, but not exclusively, dedicated to the conclusion of the Andean microwave network. Second, the **Sistema Andino de Telecomunicaciones por Satelite-SATS** (Andean Telecommunications Satellite System), which basically deals with the full implementation of the regional CONDOR system. Third, the **Sistema Andino de Teleinfomatica-SATEL** (Andean System of Teleinformatics), now working on the installation of a subregional telecommunications data network in order to serve the informational needs of the associated Andean PTTs. And finally, the **Proyecto Andino de Fabricacion de Equipos de Telecomunicaciones-PAFET** (Andean Project of Telecommunication Equipment Manufacturing), oriented towards reaching scale economies in the production of selected types of

telecommunication hardware, in accordance with the needs and real possibilities of the Andean subregion.

In July, 1983, physical integration including telecommunications was identified by the Commission of the Cartagena Agreement as one of the eight key factors to reactivate the Pact. Likewise, as part of the new Andean strategies for the industrial sector, cooperation activities in electronics and telecommunications were considered a priority.¹⁰⁴

Actually, the renewed emphasis on subregional communications integration came from the Andean presidents themselves. In fact, by means of the Caracas Declaration of 1983, the Andean heads of state outlined new principles for the future integration of the Andean subregion, pointing at the most crucial production activities. In this document, the five Andean presidents declared essential to concentrate greater efforts in the development of communication systems "capable of transmitting messages throughout the subregion in improved conditions of speed, security and low cost."¹⁰⁵

Almost immediately, during the II meeting of Andean Ministers of Transportation and Public Works (in July of 1983), the Andean Pact countries approved a key document: the "Andean Development Strategy in the Physical Integration Area: Transportation and Communication Sectors."¹⁰⁶ Based on recommendations made by the VI Meeting of the Physical Integration Council,¹⁰⁷ the Andean ministers agreed that the

principal objective of subregional strategies in physical integration was to contribute with a harmonious and balanced development of the Pact's territory. Trying to achieve a rational use of its physical space, transportation and communication systems were therefore supposed to be focused on furnishing the subregion with greater and better possibilities of interconnection.¹⁰⁸

According to the high regional officials, Andean communication services ought to be enlarged, coordinated and improved as a necessary prior step towards achieving an effective expansion of the subregional market. Hence, in terms of the telecommunications area in particular, expanding the domestic and intra-regional trunk lines as well as improving the telephone service in each member country were deemed fundamental.¹⁰⁹

Trying to advance in such direction, ASETA began to make some important accomplishments, like the completion of the already mentioned Andean microwave network by the end of 1984. Certainly, after seven years of arduous multilateral and bilateral negotiations, the ASETA countries finalized this long-lasting project, linking via-microwave the capitals and principal trade centers of the Andean world. This system, initiated in 1977, right after the suspension of the first studies and discussions on CONDOR, makes it now technically possible the domestic and intra-regional transmission of radio and television programs among the Andean republics.¹¹⁰

The Andean SAT-Microwave project is now working in both the implementation of a direct dialing system and the interconnection of the Andean facilities with the Inter-American microwave network.¹¹¹ As Jaime Aguilera, ASETA's General Secretary, pointed out in a subregional seminar:

With the conclusion of the terrestrial Andean Microwave network (that already links Caracas to La Paz), a first big step has been taken towards a truly operational Andean telecommunications system working in the interests of the Andean subregion.¹¹²

Other on-going ASETA projects such as PAFET, SATEL and, especially the CONDOR project, are progressing at different paces. On March 16, 1984, for instance, an Andean meeting on the PAFET project formulated technical specifications on a few types of telecommunication equipment, which should be produced either by the ASETA-member enterprises or a subregional telecommunication multinational to be created in the future.

After some studies of equipment selection and marketing, ASETA thinks that prototypes and final production of low-capacity switching central units, PCM units for rural telephony, modems and UHF transmitters and receivers can be feasibly produced in the Andean subregion.¹¹³ Also, technical specifications on satellite antennae have been sent to the various Andean telecommunication entities, in order to obtain from them competing proposals for their engineering and manufacturing. Financing for these prototype-antenna developments are being negotiated with the both Corporacion

Andina de Fomento (CAF)¹¹⁴ and the European Economic Community (EEC).¹¹⁵

Between 1975 and 1980, while trying to strengthen their electronic and telecommunication industries, between 1975 and 1980, the Andean Pact countries made great efforts towards building subregional multinationals based on the combination of local private and public investments. However, as Salinas observed, all kinds of pressures from foreign multinationals and their respective embassies (particularly those of the U.S.) forced the Pact to quit such endeavors.¹¹⁶

Similar arguments against subtle pressures of foreign multinational corporations were made in ASETA during a special board meeting, soon after the advanced publication of the CONDOR network. In this extraordinary session (called as a result of an incident occurred in Geneva in March of 1985, in which detrimental statements of ASETA's performance and involvement in the CONDOR project were made, apparently, by the representative of the Ministry of Transportation and Communication of Venezuela himself), several ASETA officials sustained that those anti-association assertions were nothing else but the result of maneuvers inspired by foreign interests. In fact, as Carlos Chiang observed, he noted that while working in ASETA:

... every time a new integration initiative is generated, foreign multinationals orchestrate a campaign to undermine it.¹¹⁷

In a similar fashion, Antonio Escalona, another ASETA

board member, stated that despite these "ill intentioned rumors coming from foreign multinationals against the Andean telecommunication association (which--according to him--are ultimately intended to block the CONDOR project), ASETA should simply keep progressing in the implementation of the regional system."¹¹⁸

Today, under a different economic and regulatory environment (e.g. with previous subregional regulatory restrictions on foreign capital flows already lifted), ASETA is again trying to build telecommunication equipment manufacturing companies within the subregion. Great hopes are placed in developing Andean multinationals in the line of **Maplatex**, a Venezuelan manufacturer 60% percent-owned by CANTV which now holds a domestic monopoly in the supply of telephone sets. Apparently, this company is now fabricating various kinds of telecommunication equipment based on imported designs and components.¹¹⁹ At any rate, the success of the PAFET project, as Forero observed, seems to depend on the fact that every other Andean Pact country develops at least one type of telecommunication equipment.¹²⁰

In the meantime, ASETA is also engaged in an ambitious subregional project of teleinformatics. This initiative, called SATEL--proposed and adopted in January 1982 during the XIII meeting of the ASETA's Board of Directors, is a three-fold project. It intends first to provide subregional bibliographic and documentary services to the national

telecommunication enterprises. Secondly, it plans to offer subregional scientific processing in telecommunications. And finally, it expects to provide training for the Andean PTT's personnel.¹²¹ Progress in these areas seems slow, however, as greater financial assistance is pending. Notwithstanding, documentary services like the Red de Documentacion del Sistema Andino de Informacion de Telecomunicaciones (REDOC-SAITEL), and an Andean data base on telecommunication systems and equipment are already on their way.

Despite its relatively small advance, the importance of the SATEL and PAFET programs look undisputable. In fact, as Salinas once pointed out, Third World countries need to develop capabilities of equipment manufacturing in order to accumulate, process and transmit information, as well as to upgrade their skills to maintain and operate systems for information processing and transmission.¹²²

On the other hand, on May 1, 1985, ASETA officially established the Comision Andina de Radio y Television (CART).¹²³ Following a recommendation of the I Meeting of Andean Ministers of Transportation and Public Works, ASETA had proposed the creation of CART in September of 1982. The commission came to be organized in three sub-commissions: radio and television infrastructure, television production, and radio production.

The purpose of CART is not only to bridge the gap between the Cartagena Agreement and the mass media in every single

member-country, but primarily to promote the exchange and coproduction of news, sports and cultural programming within and about the Andean subregion.¹²⁴ Two years later, between February and April 1987, a 30-minute program dealing with the historical and cultural roots of the subregion, called **Nuestra America**, was being broadcasted in prime time television in every Andean Pact republic.¹²⁵

In sum, throughout its almost two decades of existence, ASETA has carried out studies and activities on at least 50 different projects. A highly praised event has been the celebration of periodical telecommunication exhibitions known as the **Jornadas Andinas de Telecomunicaciones (JATEL)**--held every two years.¹²⁶ In 1985, the fifth JATEL took place in Cochabamba, Bolivia, giving once again Andean telecommunication entities and professionals the opportunity to have seminars and special meetings on telecommunications technology and policy advances.¹²⁷

More recently, on June 9, 1987, the two principal communication-related branches of the Andean Pact, that is, ASETA and the Andres Bello Covenant (more precisely, the **Instituto Internacional de Integracion--III**), signed a cooperation agreement. This bilateral accord is primarily intended for the provision of information exchange and expertise in telecommunications, as well as, research projects to facilitate training in telecommunications and informatics.¹²⁸ It is worth noting that besides the Andean

Pact countries, Chile and Panama are also subscribed to the Andres Bello Covenant.

In brief, today, every Andean republic show not only some degree of dependence on satellite technology for their domestic, regional and/or international communications but also a gradual increase in the expansion of its satellite telecommunications infrastructure. Also, subregional efforts in telecommunications, in particular, those coordinated by ASETA, prove that a keen interest for pro-development applications of satellite-based technologies has accompanied the Andean Pact throughout its twenty years of existence.

CHAPTER 3

THE CONDOR PROJECT

The CONDOR project is already a 12 year-old initiative. Certainly, since 1976, the Andean Pact nations have been discussing the possibility of having a regionally-owned satellite network of their own.

Project Antecedents

In addition to SERLA's initiative, other satellite experiences within the Andean sphere--mainly at the domestic level--have contributed to shape the CONDOR project's conception. Perhaps, the most influential of all has been the Colombian satellite program *Satelite Colombiano* (SATCOL).

In April of 1976, Colombia started to develop the SATCOL project as part of an international claim of sovereignty over portions of the geostationary orbit, which this country considers to be an integral component of its national territory. As Nino observed:

Colombia claims since 1975 sovereignty over the geostationary arc [crossing over its national territory]. Some countries and organizations planned to locate satellites in it, and for this reason of international policy, [this country] decided to exercise its sovereignty by positioning [in the GSO] a Colombian satellite.¹²⁹

During the IV Meeting of the ASETA's Board of Directors in September 1976, as part of a general discussion on the utilization of communication satellites in the Andean

countries, Jaime Aguilera, at that time delegate of Colombia, presented the global characteristics of the TELECOM-Colombia's SATCOL program. Particular attention was then given to this country's concerns over the geostationary orbit.

By virtue of this meeting, the representatives of every Andean Pact country had the opportunity to once again show their interest in a subregional satellite. With the economic and technical assistance of ENTEL-Chile and IETEL-Ecuador, respectively, Venezuela's CANTV was then commissioned to elaborate a preliminary study on the feasibility of a communications satellite for the Andean subregion. This study came to be known as the SATAN project (a not very suitable acronym).¹³⁰

Six months later, the Venezuelan delegation presented the results of such study in a new board session, indicating that its conclusions were based on preliminary data. Following its presentation, the Andean delegates ratified their intention to pursue the satellite project, even though, as Ospina observed:

ENTEL-Chile's economic projections were negative; they showed that it did not matter whether the transponders were leased or bought, or whether a satellite was dedicated only to ANCOM [Andean Pact] communications. The results of the economic projections showed varying degrees of loss, and only one alternative showed a slight financial gain.¹³¹

In this V Meeting of ASETA directors, the name of the Andean satellite project was officially changed to CONDOR,

and special funds for further investigations on this project were requested from the Corporacion Andina de Fomento (CAF). More importantly, in this meeting, Colombia announced that it would simultaneously continue with SATCOL unless the regional satellite proved to be feasible and supported by the other Andean Pact members, in which case, Colombia would renounce to its domestic satellite endeavors.¹³²

In May, 1977, among four competing foreign firms, ASETA contracted the expert services of a application from the Canadian Astronautics Limited and the SATEL Consultants Limited Company of Ottawa, in order to carry out overall technical, economic and financial feasibility studies for a telecommunications satellite in the Andean subregion.¹³³ These investigations were executed between June and September of 1977.

Evaluating six different options from a jointly owned system to a long term leasing arrangement with either INTELSAT or an emerging satellite transponder supplier, CAL/SATEL concluded that:

... the CONDOR system [was] a project extremely attractive as a solution to the multiple, actual and projected telecommunication needs of the Andean subregion.... conclusions lead to determine that the CONDOR system [was] technically and economically feasible, considering the established costs and demand...¹³⁴

Experts from CANTV and IETEL also participated in the feasibility analyses, whose results were presented to the VI Meeting of the ASETA's Board of Directors in October, 1977.

At that time, CONDOR planned to become operational in 1982 and although the regional system showed positive signs of technical and economic feasibility, in the end, the project was not carried out. As Marco Solano observed, each country decided to pursue, individually, further satellite telecommunication experiments and actual-need evaluations. For ASETA, the decision to suspend CONDOR represented what they called a "dynamic freeze" of the project, during which the subregional association would have time to internally discuss this subject further.¹³⁵ Ecuador recommended nonetheless that it would be wise to start registration procedures for an Andean satellite network at once. Although discussions about the use of satellite telecommunications in the subregion did take place during the VII and VIII ASETA board meetings, in practice, CONDOR was completely put off until January 1982. In fact, soon after the "freeze," Angel Velasquez of ENTEL-Peru, an active liaison Peruvian official in ASETA, wrote:

Although all member-countries in the Association [ASETA] are interested in the CONDOR system, paradoxically, the variety of interests limit the implementation of this project ...¹³⁶

In the meantime, Colombia continued to work on its SATCOL project. Similarly, in 1981, both Peru and Venezuela had also individually announced to be engaged on studies for their respective domestic satellite systems.¹³⁷ Bilateral satellite projects were also attempted during CONDOR's lethargy. For example, as early as November 1977, the Communication

ministers of Colombia and Ecuador agreed to carry out a joint study for a binational satellite network to be placed in their respective segments of the GSO--as part of their mutually supported claims of space sovereignty over the equator.

Apparently, both countries planned to make an advance notification of this system--to be called CONDORSAT--but the project never went beyond a few talks. At one point, there were rumors that CONDORSAT would receive a strong investment from Venezuela turning the initiative into a Grand Colombian enterprise. It is still unknown what were the final results of such diplomatic contacts.¹³⁸

On April 18, 1978, the Brazilian government also addressed the Communications Ministry of Colombia to propose a bilateral satellite system. Colombia originally accepted the invitation, but again, the idea was soon after dropped without public comment on which country dismissed it and why.¹³⁹

Most of the proposed satellite ventures were in one way or another related to the SATCOL program, to the extent that, even two American multinationals, Ford Aerospace and Communications Corp. and Hughes Aircraft Co., offered themselves as partners in SATCOL to then rent satellite services in neighboring countries.¹⁴⁰

In January 1982, after several failed attempts at having a satellite in the Andean subregion failed, Peru decided to

revive the CONDOR project in ASETA. Almost simultaneously however, Colombia opened a public bid for the construction of its SATCOL satellites and control equipment.

On September 22, 1982, after reviewing proposals submitted by the West German consortium Messerschmitt-Bolkow-Blohm (MBB), the American RCA Corporation, and ITT of Colombia (subsidiary of the ITT Corp. of the United States), Colombia failed to award the intended contracts. The SATCOL program was then indefinitely suspended; although not cancelled, since after all, SATCOL was still a validly notified network in ITU until the year 1988.

The U.S. multinational applications in the SATCOL contest were either incomplete or not adjusted to the terms of the public bid. The West German offer was formally and technically appropriate but too expensive in the opinion of the Colombian officials. Still, part of the failure to award the contract was attributed to the short period of time given for proposal submissions--only six weeks including one deadline extension.

The Colombian government (at that time coming out from a recent election and whose officials had apparently taken no major role in previous developments connected to SATCOL), argued that new evaluations of existing alternatives were necessary in order to arrive at clearer conclusions on the real telecommunication needs of the country.¹⁴¹ Again, if the SATCOL experience taught anything to the Andean world, it was

that domestic satellite plans (at least in these countries and for the time being) were not the ideal way to go in solving the telecommunication deficiencies of the subregion.

Now that CONDOR is progressing, Colombian communication authorities have recognized that SATCOL had been really stopped because of its very high costs. The Colombian Ministry of Communications is therefore convinced that the CONDOR satellite project, in conjunction with other Andean Pact neighbors, represents a more realistic approach to the satellite issue.¹⁴²

The Revived CONDOR

When Peru proposed to bring CONDOR back to life during the XIII Meeting of the ASETA's Board of Directors, new perspectives in satellite communications for the Andean subregion were immediately opened. Namely, the possibility of reducing and sharing satellite television transmission costs among the Andean Pact members, of updating and completing feasibility studies on the regional satellite, and of building a more integrated subregional telecommunications infrastructure.¹⁴³ Also, the chance to finally define the CONDOR networks' institutional and technical configuration and its implementation schedule, emerged as new possibilities.¹⁴⁴

Peru paved the way for the revival of CONDOR during ASETA's XII meeting of the Board in 1981. As the Peruvian representatives in that occasion noted, efforts on satellite

communications and new information technologies were of utmost importance to the subregion for having them suspended any longer. For the next three Board meetings (XIV, XV and XVI), ASETA worked in the reorganization of its satellite project. Beginning 1983, in Panama city, Panama, the Peruvian delegate, Angel Velasquez, proposed that CONDOR should be structured in two phases.

Phase one, short term and transitory (1985-1990), should target for an Andean Pact's joint-lease of space capacity with INTELSAT. During this stage, member-countries would be expected to gain administrative experience in sharing the same transponders. A second and more medium-term phase (1990-2000), would implement launching and operating a regionally-owned space segment.¹⁴⁵ In this XIV meeting, concrete steps were taken towards updating the 1977 CONDOR feasibility study. Also, tests were executed relating to the shared-use of INTELSAT satellites. In addition, the need for the creation of an Andean multinational satellite organization was put on the table.

In December, 1983, in Santa Cruz de la Sierra, Bolivia, an ASETA expert submitted to the XV meeting of the board the results of the study, "Sistema Regional Andino de Comunicaciones por Satelite con Capacidad INTELSAT Compartida: Aspectos Tecnico-Economicos."¹⁴⁶ This report sustained that a joint-lease of INTELSAT transponders for domestic and intra-regional television, telephony, telex,

telegraphy and data communications, would represent for the Andean Pact countries not only savings in rent payments but greater experience in satellite communications management. By means of these experiments, the Andean telecommunication administrations expected to learn how a multiparty operational satellite system worked.¹⁴⁷ Also, important data on the actual and estimated demand for domestic and intra-regional satellite services were introduced as part of this report.

For the purpose of executing the first stage, ASETA felt necessary to convince television programmers in every member country about the benefits of sharing satellite transponders; thus, inviting the private sector to get involved with the project was considered crucial. Simultaneously, they initiated due consultations with INTELSAT about the possibilities of both running experimental tests and negotiating a joint Andean lease.

However, in this XV meeting, ASETA also discussed a second report: "Sistema Andino de Comunicaciones con Satelite Propio."¹⁴⁸ After reviewing the convenience of a regional satellite for the Andean Pact area, ASETA decided to contact the Board of the Cartagena Agreement in order to include CONDOR in the agenda of the next planned Andean meeting of ministers of communications.

In fact, ASETA's XVI Board assembly held in Bogota, Colombia, in September of 1984, was the previous stage to

this ministerial summit which later became a landmark event in the history of satellite communications for the Andean area. In Bogota, ASETA's top officials decided, in the first place, to formally request INTELSAT free transponder time in their satellites so that experimental trials of joint television transmissions, originated and received in three Andean Pact countries (Colombia, Peru and Venezuela), could be run. Likewise, they agreed to recommend the Andean ministers to give CONDOR priority status in the overall physical integration platform of the subregion. Finally, the Andean communication ministers were also asked to call for the advance publication of the CONDOR network before the ITU's International Frequency Registration Board (IFRB).¹⁴⁹

As planned, in November of that same year, in Cartagena, Colombia, conclusions of the III Meeting of Andean Ministers of Transportation, Communication and Public Works went in the direction ASETA had hoped for. After emphasizing on the importance of having a communications satellite for the subregion, the Andean ministers declared CONDOR a priority project and designated a special commission to work for its immediate advance publication. Also, provisions were made in favor of the final realization of the proposed experimental tests with INTELSAT.¹⁵⁰

CONDOR in the IFRB

On March 8, 1985, a special commission of the Andean Pact submitted the required documentation to the IFRB in order to obtain the advance publication of the CONDOR network.¹⁵¹ Following the due process contained in the ITU Radio Regulations, the advance publication was officially completed on July 9, 1985. Comments of potential interference from other telecommunication administrations began to be received by ASETA's staff nine months later.

CONDOR's advance notice announced that a three-geostationary satellite system of the Andean countries would, tentatively, start operations on June 30, 1990. These spacecraft were to be located on what these countries consider to be their own segments of the GSO, as follows: CONDOR-A at 77.5 degrees W. longitude (above continental Ecuador); CONDOR-B at 89 degrees W. long. (over insular Ecuador, that is, the Galapagos archipelago); and CONDOR-C at 72. degrees W. long. (right above Colombia). In accordance with the 1979 WARC's Resolution 4, such notification would expire not until July 9th of the year 1995.¹⁵² Recent ITU decisions in WARC-ORB-88 has extended this period even further.

On April 8, 1986, ASETA initiated the coordination process, after official notifications of eventual interferences with CONDOR were received from INTELSAT, INMARSAT, Argentina, Brazil, the USSR, the USA, Pakistan and

Trinidad and Tobago.¹⁵³ In fact, using ITU's computer software, ASETA confirmed that major unacceptable levels of potential interference existed with both Brazil's SBTS and Argentina's NAHUEL networks, and in much less extent, with a number of spacecraft of the United States.¹⁵⁴

Based on prescribed ITU Radio Regulations procedures, coordination negotiations between ASETA and the concerned foreign administrations began to take place in 1987 in order to resolve the alleged interferences.

Technical Configuration

As mentioned elsewhere, ASETA had originally decided to follow a two-step approach in carrying out the satellite plan. On June 27, 1985, as part of the first phase, and in order to execute transmission experiments with television signals between Colombia, Peru and Venezuela, the Andean association requested INTELSAT permission to use a 72 MHz transponder for 15 days.¹⁵⁵ Similar experiments for telephone, telex and data communications as well as intra-regional satellite services, were also planned to be executed later on. For this last purpose, ASETA contacted the International Applications Development Program (IADP) which will help the Andean Pact countries to elaborate technical and operational feasibility studies based on data provided by the subregional association.¹⁵⁶

ASETA wanted to test the possibility of fitting 8 TV channels into one single transponder, hoping to provide

evidence which justified the convenience of a joint domestic transponder lease with INTELSAT, resulting in a more cost-effective arrangement for the Andean Pact countries. INTELSAT acceded to the Andean petition offering, for 30 days and for free, the requested transponder capacity. Information on shared-use leasing prices as well as technical assistance to run the experiments, were also provided by the international consortium.¹⁵⁷

Two technical trials took place between 1985 and 1986. The first one was performed on September 19, 1985, and a second one, on February 3, 1986. Generally speaking, the experiments proved to be a relative technical success demonstrating that a common use of the same space segment was in fact feasible, as ASETA had initially thought.¹⁵⁸ Nonetheless, as Angel Velasquez remarked during the II Meeting of the *Comite Tecnico Asesor (CTA)*¹⁵⁹, although three tests had been originally scheduled, only one of them was finally executed. Also, he observed that even though direct reception of television signals had been reasonably acceptable, many problems existed at the time of distributing such signals.¹⁶⁰

In the end, the first phase of CONDOR, this is, the joint Andean Pact lease, was never implemented. According to ASETA, INTELSAT's decision to assign different satellites for domestic services in the Andean countries practically terminated this initiative, impeding the realization of further necessary tests.¹⁶¹ According to Joseph Pelton,

however, no records of additional requests on behalf of ASETA exist in INTELSAT dealing with intended experiments with telephone, telex, and data or any other satellite transmissions within the Andean area. As he noted, "had this type of request been made to INTELSAT, it would have been most likely approved since it involves less space segment capacity."¹⁶²

In the meantime, as a consequence of major improvements in the diplomatic relations between the European Economic Community and the Andean Pact since the early 1980's,¹⁶³ France offered the Cartagena Agreement open cooperation to launch and maintain its projected satellite system. In fact, in October 1984, the French Minister of Communications, Louis Mexandeaus, announced that France could become a valuable supporting partner for the CONDOR project considering this country's advanced satellite technology.¹⁶⁴ In the same token, while attending the V JATEL in February of 1985, Alejandro Bichi, an EEC representative, declared that perhaps a European low-capacity and low-cost experimental satellite could be used for CONDOR.¹⁶⁵

There were similar offers made by U.S and Canadian entities however. On January 20, 1985, for instance, Hughes Aircraft offered the Colombian government the PALAPA B-2 satellite (by then, recently recovered by the Discovery mission), at a 25% reduced price. Provisions to assure its launching with NASA were included in the sale package. This

offer, however, was made to Colombia instead of ASETA, knowing this country's interest, experience and influence in satellite communications within the Andean context, but implicitly undermining the Andean Pact and its telecommunication association.

On February 24, 1985, Colombia rejected the offer arguing that the proposed launching schedule made impossible for this country to adequately develop the necessary ground segment and take full advantage of the satellite. Nor was there--as Colombians officials said--enough time to prepare plans of commercialization of the satellite's excess capacity with neighboring countries.¹⁶⁶

Similarly, in September 1985, TELESAT-Canada offered (to ASETA this time), the NASA-recovered spacecraft, WESTAR VI. The Andean Pact countries did not immediately reject the offer, but they put it off for future consideration. So far, nothing else has been heard in this respect.¹⁶⁷

Finally, in trying to advance the final configuration of the CONDOR network, ASETA decided to contract a second feasibility study with the European Space Agency's subsidiary, the European Satellite Consulting Organization (ESCO). The EEC awarded ASETA a non-reimbursable credit to execute such a study, and in September of 1986, ESCO turned in its final results to the ASETA's VI Meeting of the Technical Advisory Committee.¹⁶⁸

Based on service demand calculations provided by the

subregional telecommunication entity and after weighing several alternatives, ESCO concluded that a satellite system of their own would be best adapted to the fulfillment of ASETA's satellite interconnection demands and requirements. Yet, the study warned:

In case of a rather lower demand for satellite services, the conclusions of the study would be rather different.... [the] system involves a certain financial risk if the requirements are lower than the forecasts for the 90's. However, the risk can be minimized by the study of an appropriate strategy of implementation of the space segment.¹⁶⁹

Thus, due to the fact that the possibility of sharing transponders with INTELSAT had failed, the Andean Pact countries decided to fully concentrate on the second phase of the project: the CONDOR network.

At the present, the regional Andean authorities have scheduled for launching--sometime between 1992 and 1995--two geostationary satellites of 24-transponders and 36 MHz bandwidth each (with 40 MHz transponder spacing). Each satellite would also have 37.2 dBw/EIRP and 10 years of useful life. There will be an identical third spacecraft available on the ground.

All three spacecraft are being registered to operate in the C-band although the alternative of using hybrid C-Ku band satellites has not been ruled out yet. The CONDOR network will have complete coverage of the Andean subregion, transmitting at EIRP levels which will allow for the interconnection of currently available standard A and

standard Z earth stations. Also, since one of the principal purposes of CONDOR is to serve the rural areas, the Andean satellites would look forward to work with small 3.5 to 4.5 diameter antennas.¹⁷⁰

As far as CONDOR's ground segment is concerned, the Andean antennae is expected to consist of 748 transmit-and-receive earth stations for telephony, telex and data communications, 878 transceivers for television services, and 44 receive-only dishes.¹⁷¹ Apparently, in order to reach greater levels of interactivity, the greatest number of antennas to be used will be capable of transmitting and receiving either television or telephone, telex and data signals.

Finally, in what appears to have been a political rather than a technically motivated-decision, each member-country will have its own individual tracking, telemetry, telecommand and monitoring (TTC&M) station, coordinated by the system's headquarters located in Caracas, Venezuela. Originally no more than three of them were thought to be necessary.¹⁷²

In this respect, Mario Pachajoa, Permanent Secretary of the Conferencia Interamericana de Telecomunicaciones-CITEL of the Organization of American States, affirmed that the lack of a valid technical reason for such a measure only reflects the complexity of the Andean political negotiations about what country should have the control center of the regional satellite.¹⁷³ Although not the ideal technical solution, since managing five TTC&M stations may result in multiple

future system-operation complications, with this compromise the ASETA countries surpassed one of the most politically cumbersome stages of the project.

Economic and Financial Profile

In June 1987, Miguel de la Rosa, Director of ASETA's Department of Satellite Affairs, assured in an interview that the nominal costs of investment in this project would be U.S.\$209 million dollars and "no more than that."¹⁷⁴ However, as a result of the recently added number of TTC&M stations, the start-up costs has gone up to U.S.\$220 million dollars.¹⁷⁵ In reality, based on ASETA projections, the CONDOR project's total execution costs would come to approximately U.S.\$1 billion dollars. This figure breaks down into the U.S.\$220 million for the space segment and approximately U.S.\$840 million in short, medium and long term expenditures on the ground segment.¹⁷⁶ The total investment will be distributed in five portions: equal payments of U.S.\$58.5 million dollars (28%) to be made by the "big three" Colombia, Peru and Venezuela (CO-PE-VEN), and two equal portions of U.S.\$16.7 million dollars (8%) to be paid by Bolivia and Ecuador.

Throughout its twelve years of existence, the CONDOR project has received financial assistance from two major sources: Canada and the European Economic Community. In 1977, the Canadian government contributed U.S.\$400,000 dollars for the CAL/SATEL feasibility study.¹⁷⁷ During the 1980's,

however, the Canadian International Development Agency (CIDA) has only offered expert-time only for the second phase of the project. Some kind of financial assistance from CIDA in the near future, is not ruled out nonetheless.

On the other hand, in December of 1985, the EEC assured a non-reimbursable contribution of U.S.\$400,000 dollars also, pursuant to CONDOR's second feasibility study. More recently, the European Community has announced its willingness to finance, once again in non-reimbursable basis, the engineering-design studies of CONDOR. Likewise, on February 3, 1986, a proposed contribution from the Swedish Agency for International Development was being studied in ASETA, but the subregional entity decided to refuse it in order to avoid any potential conflicts with previous EEC's offers.¹⁷⁸

With the assistance of the Andean Development Corporation, ASETA has also made further contacts with agencies of the United States and multilateral institutions to obtain financing. On April 2, 1985, ASETA's General Secretary announced that the U.S. Trade Development Program (TDP) was ready to donate \$3.5 million dollars for CONDOR.¹⁷⁹ However, as recorded in subsequent board meetings, the TDP seems to have finally come down to an offer of \$750,000 dollars intended for the financing of the engineering-design stage.¹⁸⁰

Contacts have also been made with the World Bank and the

International Bank for Reconstruction and Development (IBRD) as well as with the Inter-American Development Bank (IDB). As a matter of fact, on May 31, 1982, officials of the Andean Development Corporation and the Board of the Cartagena Agreement agreed along with top representatives of these multilateral entities to establish an inter-institutional coordination system for the study of project financing alternatives in the Andean subregion. Periodic semester IBD/IBRD/CAF/JUNAC meetings were being held with the idea of giving greater financial possibilities for subregional projects in the physical integration area.¹⁸¹ After six years, however, no loans have been awarded in connection to the CONDOR project. Little hope seems to be placed on these organizations, which at present times are still known for their inferior role in supporting telecommunication-related development projects.

Although ASETA has carried out several studies trying to accurately predict the potential demand for CONDOR's future domestic and intra-regional services, reliable and convincing data has not been made publicly available yet. Nevertheless, since the first feasibility study in 1977, ASETA has been pressuring the associated telecommunication administrations for the obtention of need-assessments and demand evaluations reports. Under ASETA's recommendation, the III Meeting of Andean Ministers of Transportation, Communications and Public Works even ordered the creation of national committees in

every member country to establish the actual public and private demand for satellites services.¹⁸² Apparently, internal domestic bureaucratic delays and not infrequently the actual impossibility to gather the requested data, have contributed to the ASETA's difficulty of producing more conclusive demand-projection analyses. Still, ASETA projections for 1985 indicated that the Andean Pact countries needed 1896 channels (588 FDM/FM, 1286 SCPC, and 22 TX/Data) for domestic telephone, telex, telegraph and data communication services. As for domestic television goes, there was a circuit-transmission need to serve a total number of 8 national television networks. Furthermore, 258 CFDM/FM channels and 1 TV carrier were also necessary to cover intra-subregional needs. All satellite services were supposed to be provided with 72 earth stations scattered throughout the Andean subregion. ASETA has emphasized that these are conservative figures of the potential short term demand for satellite transmission space.¹⁸³ This traffic would be equivalent to at least 6 transponders of 36 MHz bandwidth.

By 1985, altogether, Andean Pact's long term leases with INTELSAT were already equivalent to at least 4 transponders (36 MHz), being apparently increased by 1987 to as much as 5 1/4 transponders.¹⁸⁴ Still, as of 1988, approximately 40 earth stations of the 72 projected for 1985 were actually in operation.

Economically speaking, ASETA believes that CONDOR would be

a profitable enterprise if appropriate pricing policies are adopted by the participating telecommunication administrations. Rough estimates calculate that consumer prices will be in the range of U.S.\$.12 cents to .40 cents per minute call. In short, ASETA is convinced that based on present and future costs figures as well as demand and profitability projections, "there is no alternatives to the CONDOR system."¹⁸⁵ As Miguel de la Rosa remarked:

... project [CONDOR] constitutes the cheapest alternative that, other things being equal, can satisfy the projected subregional demand for this last decade of the century. As every other project, a series of investments which imply an obvious risk are necessary, ... but such risk has been calculated and, I believe, minimized. Yet, a delay in the evolution of the estimated demand might be inconvenient since the system has a useful life until the year 2,003.¹⁸⁶

Politico-Institutional Framework

On March 25, 1988, presidents of the five Andean telecommunication enterprises signed the provisional agreements which created the Organization Andina de Telecomunicaciones por Satelite (OATS).¹⁸⁷ Following the same lines of the INTELSAT accords, the principal and operating agreements of this new Andean multinational enterprise were expected to come into effect not until six months later, provided that, at least, four members ratify or provisionally endorse such instruments. OATS will have its headquarters in Caracas, Venezuela.

There will be a Board of Governors composed of representatives of each signatory countries, with voting

powers equivalent to the respective investments. This body will meet no less than four times per year, and during its first meeting it will appoint a General Secretary who will act as OATS's legal representative until the first General Director takes office. The principal authority of the organization will be the Assembly of Parties.¹⁸⁸

OATS' first General Director and Legal representative will be Colombian citizens, with a Peruvian executive as Adjunct General Director. Peru will also be in charge of the Development Management division, while the Operations and Commercialization Management offices will be handled by Bolivians. The Engineering and Resources managers will come from Ecuador, and Venezuela will be the Chief Controller. These positions will be rotated every three years.¹⁸⁹

On the other hand, OATS will have to be approved by a new Andean Meeting of Ministers of Transportation, Communication and Public Works as well as by the national legislatures of each Andean Pact member. Beginning April 1988, every single Andean republic was found studying to the appropriations and financial contributions criteria as well as the selection process of its first executive members.¹⁹⁰ In this same month, and following the mandates of the III Meeting of Andean Ministers of Transportation, Communication and Public Works, ASETA created a multilateral satellite commission in order to assume the CONDOR project's activities until OATS becomes operational. Actually, the Comision Andina de

Telecomunicaciones por Satelite (CATSAT)¹⁹¹ will be responsible for calling OATS' first meeting of the Board of Governors.

CATSAT is now in charge of orienting, promoting and leading all activities concerning the implementation of the satellite project. The already mentioned technical support committee, CTA, is assisting CATSAT in the fulfillment of these tasks. Simultaneously, ASETA has created a separate division, the Departamento de Asuntos Satelitales (DAS), which together with ASETA's General Secretary is acting as the project's coordination unit. ASETA's DAS, CATSAT and CTA are thus working not only to bring about OATS but also to formulate the terms of reference upon which the satellite manufacturing and launching-service contracts will be awarded.

Undoubtedly, politically speaking, CONDOR came to be more decisively supported by every Andean Pact member after the III meeting of Andean ministers of 1984, in which the subregional satellite project was declared a priority. Also, the fact that ASETA officially endorsed the Equatorial countries' claim of sovereignty over the GSO, contributed to enhance the satellite project's political commitment. In fact, Bolivia, Peru and Venezuela were equally interested in protecting CONDOR's geostationary orbital positions, joining Colombia and Ecuador in their claim of privileges over the GSO.

In 1981, for instance, Peru showed its support for the Equatorial countries' positions stating in ASETA that the Andean satellite would represent the most effective defense of the geostationary orbit. One year later, as an observer, Peru attended the II Summit of the Equatorial countries held in Quito, Ecuador.¹⁹²

On June 6, 1985, Peru and Bolivia (Venezuela did not attend) joined Colombia and Ecuador in a pre-WARC-ORB declaration condemning the American "invasion" of the Colombian portion of the GSO, for moving a satellite to orbital position 72 degrees W. long. in which CONDOR-C will be located. Later, with full participation of each Andean Pact member, the ASETA countries would prepare and present joint positions in the ITU WARC-ORB conferences of 1985 and 1988.¹⁹³ As a Colombian delegate observed after the 1985 WARC-ORB, "the Andean Group's documents and the unified positions of our countries have demonstrated the benefits of the preparatory meetings undertaken."¹⁹⁴

Uses and Programming

Unlike the original project-design which planned to offer some international services, the CONDOR system will be exclusively used for domestic and intra-regional satellite communications. International satellite interconnections with the rest of the world will continue to be provided by INTELSAT.¹⁹⁵

More specifically, where appropriate and necessary,

CONDOR's objectives¹⁹⁶ will apparently be as follows:

1. To replace, expand and/or complement the existing telecommunication network in order to provide nationwide domestic telephone, telegraph, telex and data communications services (including, eventually, audio conferencing and teleconferencing), in each Andean Pact country and with special emphasis on the rural areas.
2. To replace, expand and/or complement the existing telecommunication network in order to provide nationwide domestic radio and television services, in every Andean Pact country and with special emphasis on the rural areas.
3. To facilitate domestic government communications, with particular attention to the needs of the ministries of Agriculture, Communications, Defense, Development, Education, Health, Public Works and Transportation, and other related official entities.
4. To replace, expand and/or complement the existing Andean microwave network as well as the rented satellite capacity, in order to facilitate and promote the provision of intra-regional services such as telephony, telegraphy, telex and data communications.
5. To replace, expand and/or complement the existing Andean microwave network as well as the rented satellite capacity, in order to provide at least one intra-regional television channel as well as facilitate intra-regional radio broadcasting transmission exchanges.

Although little can be said about ASETA's discussions on a more specific determination of CONDOR's potential uses and programming, the general goal is to build a public network which contributes to the solution of basic national and subregional communication needs of economic, political, cultural and integration scope. As Angel Velasquez pointed out while reviving the CONDOR project in 1982:

...the idea of [the regional satellite] gives high priority to aspects of cultural and educational diffusion as well as social integration, by means of formative programs and entertainment.¹⁹⁷

In practice, the CONDOR satellite is expected to help cope

with problems of illiteracy and other educational deficiencies, lack of diffusion of new agricultural techniques, and socio-cultural differences caused by gaps between urban centers and isolated rural areas. The satellite system is particularly intended to serve highly valued isolated production zones in order to connect them to the core of the Andean economies.¹⁹⁸

According to ASETA experts, the Andean population could be easily reached with domestically-designed via-satellite radio and television transmissions to fight illiteracy, assist teachers and students in rural schools, share scientific knowledge with peasants, impart disease prevention and family planning programs, and carry out peace and anti-narcotic campaigns as well as programs of national cohesion and subregional integration throughout the Andean territories.¹⁹⁹ At an early stage, it was also said that CONDOR could provide other additional services, such as relaying data transmissions dealing with environmental monitoring (river flows and levels, temperature, precipitation, seismic activities and the like), industrial communications, public services (e.g. electricity, railways, power plants, etc.), and medical care and emergencies.²⁰⁰

Recent unofficial estimates forecast that CONDOR's 57% of its used-transponder capacity would be dedicated to domestic telephone, telegraph, telex and data communication services, while 34% would be employed for domestic radio and television

linkages. In the meantime, only 7.4% would be initially utilized for intra-regional television and radio broadcasting services in conjunction with intra-subregional telephone, telex, telegraph and data transmissions.²⁰¹ However, at one point, the Colombian delegation in ASETA was arguing that approximately 60% of the employed transponder capacity would really be used for television.²⁰² For the Andean authorities, the projected intra-regional television channel (and later on multiple channels), shall facilitate the exchange of programs intended to promote the subregional integration of artistic, folk and other cultural and informational expressions.²⁰³

In sum, after failed attempts at the national and regional levels, the Andean Pact's satellite system appears to be progressing towards its final implementation. In fact, CONDOR's governing body has already been created, and its satellites are not only being coordinated but also expected to be contracted for design and manufacturing in the near future. In other words, up to now, despite frequent expressions of pessimism from abroad and within and with considerable hardships, the ASETA countries have managed to keep working together in the realization of this ambitious but important project.

CHAPTER IV

ADOPTION CRITERIA

Many development and integration expectations have been tied to the CONDOR project since its early days of inception. Certainly, for the Andean Pact countries, a regional communications satellite in itself may represent important achievements.

To name a few, the Andean satellite system could represent the possibility of having complete nationwide and intra-subregional access to basic telecommunication services, particularly in the never-reached rural areas. Also, CONDOR would constitute the opportunity to finally have an effective presence of these countries over the long disputed segments of the geostationary orbit. The regional system may become the main entrance of these nations to the world of computer-based information exchange in a more autonomous fashion, if future domestic and intra-subregional data-base networks continue to be developed. And, similarly, CONDOR could offer the Andean subregion the opportunity to enjoy greater political and administrative autonomy to run their own internal and subregional satellite communications.

Thus, in justifying the need for CONDOR, ASETA, as an intergovernmental entity, has developed a rationale which might be different from the ones held by members of the

Andean private sector, the academic community, the mass media, or the general public. And, most definitely, ASETA's criteria appears to conflict with the adoption logic used in developed countries, particularly the United States of America.

Many U.S. spokespersons and writers have rushed themselves into labelling satellite adoption decisions such as the Andean Pact's as "technically inefficient" and "irrational."²⁰⁴ However, as Ferreira and Mody observed:

The introduction of communication technology in First World and Third World settings frequently has more to do with political and contextual forces and less to do with technical efficiency or cost effectiveness than our research and policies acknowledge.²⁰⁵

Geographic-Related Reasons

One of the major reasons influencing the Andean Pact's determination to have its own satellite system is geography. As shown in Chapter 1, the Andean cordillera is one of the most salient physical features of the subregion, raising itself as a major natural barrier for telecommunications. The other natural obstacle, as noted elsewhere, is the Amazon region which covers extensive portions of each member-country's territory.

Not surprisingly, during the WARC-ORB conferences, the Andean Pact countries formulated joint positions concerning the negative influence of the high Andean mountain-range and the Amazons upon their national and regional development. The argument was that because of their extreme natural

conditions, the ASETA countries should fall under Resolution 3 of the WARC 1979, which gives particular attention for the distribution of GSO orbital positions and frequencies to countries with "special geographical conditions."²⁰⁶ In fact, in August 1985, Colombia presented in the preparatory CCIR meetings four papers in this direction: one of them was entitled: "Relationship Between Orography and the Utilization of the Geostationary Satel of urban centers, has been traditionally perceived as a sine qua nom condition for development. For these countries, telecommunications, particularly via-satellite ones, play a fundamental role for the ultimate goal of reaching a more harmonious subregional process of socioeconomic development and integration. As ASETA's General Secretary, Jaime Aguilera, remarked:

In this question of integration, there is a great responsibility on the part of those who are in charge of planning, building and maintaining an adequate telecommunications network. Such network should, in the first place, serve as tool of integration for national territories found today dismembered, disintegrated of their administrative centers, and thus, kept away from greater possibilities of development. Isolation of a large portion of the rural communities [as in the Andean Pact countries] is a problem that should be solved within the shortest time possible, for this is an essential previous step in confronting the stage of integration at supranational or subregional levels.²⁰⁷

ASETA believes that CONDOR will facilitate the incorporation of vast marginal zones to their respective domestic production centers, dynamizing the subregional economic scheme. To them, CONDOR may also contribute to diminish the migration trend from the rural areas to the

capital centers. The development-oriented goals of the Andean satellite project are self-evident. Whenever ASETA refers to satellite communication applications in rural settings, it is easy to detect the Andean governments' awareness and interest in pursuing the potential benefits of this technology through basic telecommunication services.²⁰⁸

However, the real issue is how to assure that those development dreams come true. As Oscar Jaramillo wrote:

Projects of providing education, health and other basic services to [Andeans], with help from the [telecommunication] media, has clashed with one reality: ... millions who do not know how to use a telephone and who have little possibilities of learning.

As he added:

The question of the satellite is not a technical issue: above all, it deals with an entire socio-economic planning. Project [CONDOR] can work, but it requires several basic conditions: ... e.g. that each country draws detailed plans for the utilization of the immense capacity of the satellite and that they do it as quickly as possible.²⁰⁹

Although there is considerable truth in ASETA's assumption that, in modern times, without telecommunications there is practically no possibilities for greater levels of economic development, such factual consideration should not be overrated. It is imperative for the ASETA countries to keep in mind that the root causes of poverty and economic disadvantage are structural problems connected to the inequalities of wealth and power. As Neville Jayaweera observed, most "Third World government's fascination with the supposed benefits of satellite technology more often than not

stem from the erroneous assumption that developing countries poverty is caused by a lack of communication."²¹⁰

Nevertheless, if pro-technology biases are both recognized and minimized to the greatest extent possible, developmental dreams based on the use of satellite communications can then be materialized. Certainly, that satellite communications are playing a key role in the unification of Indonesia, India, Brazil and Mexico, for instance, at least from the standpoint of its national telecommunications, is a widely recognized fact already.²¹¹

Technical Reasons

In carrying out CONDOR's second feasibility study, the European consulting firm--ESCO--analyzed three other alternatives: BRAZILSAT, PANAMSAT (Pan American Satellite Corp.) and INTELSAT. Technically speaking, buying or leasing transponders from the BRAZILSAT network was dismissed for its incomplete coverage of the Andean subregion, at the EIRP levels required.²¹² Furthermore, the Brazilian network apparently needed unreasonably large antennas in the provision of regional services.

The PANAMSAT alternative was also ruled out due to apparent difficulties in the provision of intra-subregional services when spot beams were to be used. In addition, certain degree of incompatibility with the existing INTELSAT-standard Andean ground segment, raised fears which contributed to discharge this possibility.

Gerardo Mesias, a Colombian representative in ASETA, had, years before, warned that if the idea was to have a dedicated regional satellite system in the near future (like PANAMSAT or CONDOR), the Andean Pact countries will be in a disadvantageous position for having extensive INTELSAT-comparable antennae. According to him, they would probably have to do some adjustments to make these antennas work with the new system, aggravated by the fact that they would be expending money in an unnecessary and expensive ground segment. Yet, ASETA acknowledged that, in the case of PANAMSAT, if the spot-beam mode was used, the system would offer the possibility of building a less expensive and well adapted ground segment for domestic satellite services.²¹³

Finally, INTELSAT was put aside because of three major reasons: uncertainties in terms of transponder availability; major technical complexities of the network; and lack of technical optimization of the required earth segment (antennas of, at least, 7.6. meters in diameter for rural services). INTELSAT was, nonetheless, found to be perfectly capable of evolving towards the provision of intra-regional services.²¹⁴

In the end, the CONDOR system was seen as technically the most appropriate alternative. CONDOR was considered not only a simpler network but also the most adapted to both the existing and the planned Andean earth segment. CONDOR also tends to show both the highest transponder availability and

the best capability to provide intra-regional services.²¹⁵

The fact that CONDOR is a dedicated satellite system (planned to exclusively serve the Andean subregion by radiating at power-levels which allow for a clear reception in rural areas with small antennae), emerged in ASETA as another powerful reason to favor the regional network.

In March of 1985, INTELSAT's Board of Governors approved the modification of its V-B satellites incorporating two regional beams, one of them, apparently, with total coverage over the Andean subregion. Four months later, ASETA was examining this new possibility in the II CATSAT meeting held in Caracas, Venezuela; its final conclusion, however, was that the best option for the Andean Pact countries was to keep renting INTELSAT transponders individually, without further changes in terms of subregional negotiations with INTELSAT.

On February 24, 1986, CATSAT's technical advisory committee, the CTA, held a special meeting intended to receive, from an INTELSAT representative, information about their new policies and planned services. Nothing different from what ASETA had already decided with respect to INTELSAT resulted from this encounter.²¹⁶

PANAMSAT, on the contrary, offered identical earth segment characteristics to the CONDOR network if spot beams were used, nonetheless, larger antennas for rural telecommunications were necessary whenever the Latin beam was

to be employed. Thus, since apparently the Andean subregion could not be entirely covered with just spot beams, ASETA did not consider the PANAMSAT alternative an appropriate choice.²¹⁷ In fact, ESCO's second feasibility study noted that PANAMSAT's north-spot beam left out the southern section of Colombia, and that the west-spot beam did not cover the southern part of Bolivia. The American-based corporation, however, claims that the Andean subregion is completely covered by its West Beam.²¹⁸

One of the most frequent criticisms against the regional satellite maintains that, with the recently completed subregional microwave network, CONDOR is neither worth it nor really necessary.

ASETA officials believe that since the goal is to have an effective region-wide coverage of the Andean Pact area (including the remote Amazons), there is no technical alternative to the CONDOR project. Referring to similar concerns in the Brazilian case, for instance, Joao Carlos Fagundes once pointed out:

Communication satellites represent the best cost effective alternative for the provision of telecommunications services to geographically dispersed and isolated areas... geographical dispersion and geographical peculiarities precluded the use of line-of-sight terrestrial systems for telephone and TV service.²¹⁹

ASETA also argues that both CONDOR and the Andean microwave network rather than substitute alternatives are complementary systems. In fact, as Heather Hudson observed,

in most cases, the least-cost solution for communication problems associated with geographic difficulties and isolation will involve a hybrid system combining satellite and terrestrial technology.²²⁰

Yet, here, it may be useful to remember what Nino wrote in dealing with the Colombian SATCOL program, if the main objective were only to integrate the border zones and rural areas to the production centers, this could be made by renting a small number of domestic transponders from INTELSAT; and, if the objective were just to attend the increasing demand for intercity circuits, then, that could be accomplished by expanding the microwave network.²²¹

But, it should be added that, if the ultimate goal is to truly link through telecommunications every corner of the member-countries' territory to each other, and, gradually evolve towards higher levels of intra-subregional satellite-based services, then, a regional satellite system like CONDOR might in fact be the only alternative. Especially when other existing satellite networks such as INTELSAT, PANAMSAT and BRAZILSAT seem to face major technical and/or policy constraints to satisfactorily serve the Andean subregion.

Economic Reasons

Economically speaking, to fully justify the huge investment in CONDOR with the present external debt of the Andean Pact nations is not an easy task for ASETA.

According to Joseph Pelton, new satellite adopters,

particularly developing countries (including those of the Andean Pact), tend to concentrate merely in both the hardware and the initial costs involved in setting up the system. Other expenses--as he observed--like the ground segment, operating and software costs, which are ordinarily much higher, are rarely mentioned.

ASETA has publicly emphasized that the "total" cost of the regional satellite will not go beyond the \$220 million dollars mark. However, internally, the subregional association is very much aware that such an amount covers, at the most, the short term costs to put up the system in place (that is, optimistically, project development expenses, purchase of satellites, launching services and insurance coverage). Other ASETA documents, notwithstanding, indicate that long term investments may well surpass the 1 billion dollars level.²²²

One obvious reason for ASETA's apparent reluctance to openly discuss the full financial implications of CONDOR, is the fact that by doing so a strong resistance against the project may be triggered off, threatening the course of its potential implementation. A second reason is that ASETA firmly believe that the recently created Andean satellite organization, OATS, once it becomes operational, will soon generate sufficient revenues to cover the initial investment and future costs of the system. They feel confident that based on subregional demand calculations for the mid-1990's,

CONDOR will in a short period of time be profitable enough to pay its bills. Money saved from domestic satellite transponder leases as well as planned microwave extension expenditures, would also come to help financing CONDOR's operating costs.

In short, the dream of the Andean telecommunication association is to build a productive and self-sustained satellite enterprise operation, despite past discouraging results and experiences with other subregional multinational initiatives (e.g. Sectoral Programs of Industrial Development--SPIDs, like the metalworking, petrochemical and automobile areas).

On the other hand, several ASETA studies and documents tend to demonstrate that accurate demand projections of satellite circuits for the next decade are difficult to calculate with available data. This circumstance foster critics to say that the investment-risk factor is something to be seriously concerned about. ASETA officials sustain, however, that the real question is not whether there are great risks connected to the CONDOR project (which is always the case in this sort of programs), but how such potential risks can be minimized. There is no doubt that ASETA have made considerable efforts in trying to precisely determine subregional demand profiles for the mid 1990's (as it was expressly mandated by the III Meeting of Andean ministers of Communication in 1984). So far, however, such evaluations do

not readily appear to demonstrate that there is a demand, large enough, to justify a system of two in-orbit 24-transponder geostationary satellites. Nor do these projections seem to guarantee that the Andean satellite network will in fact be profitable with such technical configuration, or able to offer reasonable and affordable consumer prices.

In other words, as of now, both the system's demand and its potential profitability prospects are dubious arguments to support the CONDOR project; unless more convincing and clear-cut data (reducing the uncertainties of a harmful excess capacity), is provided in the near future.

For example, ESCO's technical configuration suggestions were made on the basis of having an expected demand of at least 10 transponders--of 36 Mhz bandwidth--for domestic services in 1990. Yet, unofficial figures indicated that by 1987 the actual lease of satellite capacity in the subregion was in the order of only 5 1/4 transponders.

In 1983, preliminary assessments of needs for the next decade (as released by the five Andean telecommunication enterprises), requested a space capacity equal to 12 transponders (TXPs) broken down as follows: 2 TXPs for domestic SCPC/CFM telephone, telegraph, telex and data links; 1 TXP for domestic CFDM/FM channels (supplying additional internal links); 8 TXPs for domestic television transmissions (1 TV channel in each Bolivia, Ecuador and Colombia; 2 TV

channels in Peru; and 3 TV channels in Venezuela); and finally, 1/2 TXP for intra-regional telephone, telegraph, telex and data circuits, as well as, 1/2 TXP for 1 intra-subregional television channel.

With such a demand ("conservatively calculated" according to ASETA's opinion), the system will begin using 50% of the first satellite's total capacity. The empty transponders will act as back up until the second CONDOR is launched, two or three years later. Once the in-orbit spare spacecraft becomes available, the excess capacity in the first satellite will be slowly consumed by the progressively increasing demand for domestic and subregional space services.

Unfortunately, in justifying the CONDOR project, ASETA has yet not made public any specific information on present demand levels, nor in actual demand growth rates for domestic and intra-regional satellite services. All that is roughly known by the Andean public, if anything, is that ASETA expects to have a subregional demand of 24 transponders by the end of the useful life of the first CONDOR generations (sometime between the years 2002 and 2005, depending on the launching schedules).

Still, even if the system looks initially overdimensioned, as it is generally believed in most subregional and international expert circles, ASETA has time to reaffirm, redefine or amend CONDOR's most convenient configuration approach. After all, its satellites' engineering and design

contract guidelines are just being outlined, not existing an apparent, overwhelming reason to rush off. In other words, without making critical changes in their original time table, the Andean Pact countries could push forward the launching date of the first CONDOR to the end of 1995, giving more time for a better determination of the total demand.

In sum, the important point for ASETA is to always keep in mind that gross miscalculations of the subregional demand would surely provoke big system failures and, eventually, the complete frustration of the project.

In economic terms, and referring to the other possibilities studied, INTELSAT was considered a favorable alternative. Its minimum financial risks, translated into a major degree of confidence in the system's service commitment and operation, were highly valued. Also, INTELSAT was seen as having a moderate cost with little administrative overhead. However, based on the Andean Pact's transponder demand requirements, INTELSAT was expected to cause future availability shortfalls.²²³

As mentioned earlier, INTELSAT had announced that modifications in one of its satellites (V-B) will make additional transponder capacity available for the Andean countries, more precisely, six transponders until 1995--a year when INTELSAT planned to have in full operation one of its VI-version satellites, offering 16 transponders more to the Andean subregion. Nevertheless, ASETA considered that the

subregion will need between 10 and 17 transponders in the five year period of 1990-1995, which was much more of what INTELSAT could offer within such time span. Moreover, after 1995, ASETA felt that only very optimistic availability arrangements would make INTELSAT able of matching up the calculated subregional demand onwards.²²⁴

Also, the fact that INTELSAT gives secondary importance to domestic leases (something which, despite some efforts, the international consortium has not been able to fully overcome, resulting in a lack of attention to the technical and economic requirements of some Third World customers), ASETA felt further discouragement of going with INTELSAT. Not even as a first stage, as they had originally thought of.

In the Andean case, INTELSAT's higher ground segment costs (still more expensive than any dedicated domestic or regional system), and fears for an eventual lack of space segment availability for domestic and subregional services, when needed, contributed to discard the INTELSAT choice.

INTELSAT, however, is making increasing efforts to serve the domestic and regional needs of countries such as those of the Andean Pact. The design of more powerful satellites like the INTELSAT's VI generation and, development-oriented initiatives like projects VISTA, SHARE and now ACCESS, prove INTELSAT's willingness to respond to Third World countries' concerns.

In 1983, Joseph Pelton indicated that INTELSAT was even

studying the possibility of a separately-financed space segment for regional or other defined services, based on article III(e) of the INTELSAT Agreement.²²⁵ However, years have passed with INTELSAT not taking decisive steps in this direction. Perhaps, partly because of the strong opposition from new competitors in the sense that INTELSAT was not created to provide domestic and regional but merely intercontinental satellite services.

Thus, in the midst of such already hostile and competitive atmosphere, ASETA believes they could no longer wait for the badly needed favorable changes in INTELSAT policies. Although, ASETA has not participated in any major INTELSAT-sponsored development programs, every single Andean Pact nation has taken part in at least one of the Project SHARE's pilot activities. In fact, in January 1986, because of its "sophisticated communication network," Colombia was selected to receive the first transmission of the Miami Children's Hospital teleconferencing medical and health education project. Soon after, Venezuela, Peru, Bolivia and Ecuador, also joined the experiment.²²⁶ As a matter of fact, as of 1986, each one of the three biggest Andean Pact members has participated in three Project SHARE experiences.²²⁷ No matter how useful, such involvement have not contributed to change the Andean countries' perception of the role of INTELSAT in either domestic and regional satellite communications.

As far as the PANAMSAT alternative is concerned, ASETA

believed it was, in terms of price, the most favorable. Although it showed a convenient space segment availability, PANAMSAT was nonetheless not favored due to both its incomplete coverage and its high financial risks relating to the uncertainty of its commercial policies. In fact, ASETA believed that the decision to contract with PANAMSAT carried with it considerable risks, such as an eventual lack of continuity in the service (e.g. bankruptcy) or radical changes in the commercial policies (e.g. changes in PANAMSAT's commitment to serve the subregion, if better deals are offered down the road). Certainly, as a profit-oriented corporation, the private satellite carrier could change its commercial attitude towards the Andean Pact countries almost any time, if doing business with them turns out to be no longer that attractive. The Andean countries would then be left with a ground segment that is totally incompatible with any other satellite system (e.g. INTELSAT).²²⁸

In short, in spite of its very high costs, ASETA argues that CONDOR is actually the only alternative. The danger with this approach is that gross miscalculations of demand would transform, on the one hand, CONDOR into an extremely costly luxury and, on the other, OATS into a precarious entity. Both outcomes of disastrous consequences for the telecommunication structures of the already troubled Andean Pact economies.

Because of this, multilateral banks like the World Bank and IDB have not been receptive to the idea of co-financing

the regional Andean satellite network. Especially when there are antecedents of major economic inefficiencies in other existing satellite systems, and also, when the project organizers are a group of Third World countries. Indeed, financial institutions and particularly multilateral banks are not enthusiastic about lending money in situations where there is no one clear and primary responsible for the loan. For them, integration schemes could disappear tomorrow, leaving the banks with resulting problems of financial liability.

Multilateral financial institutions have been traditionally inferior to the needs of Third World integration schemes. As Roger Fontaine noted, precisely, because of that and within the Andean context, CAF's original task was to provide capital for investment in projects designed to have regional impact. Otherwise, CAF would be merely duplicating efforts of local development banks.²²⁹ One of the principal missions of the Andean Development Bank is the promotion of integration projects which contribute to improve the still insufficient transportation and communication systems. Still, due to elevated costs, CAF would be able to finance only a slim portion of the total CONDOR project' expenses.

During the IV Meeting of the CAF/JUNAC/BID/BIRF group on physical integration, Andean Pact representatives expressed their concern about the lack of consideration given to the

integration element in loan application evaluations made by regional banks. IBD and IBRD delegates, however, reaffirmed that the basic consideration should still be the economic one.²³⁰

Similarly, at the bilateral level, and in considering the possibilities for any future funding, the Trade Development Program of the United States (TDP) asked ASETA to prove governmental support for the Andean satellite through formal endorsements from every member-state. Such request came even after the III Andean summit of Ministers of Transportation, Communication and Public Works, had officially declared the priority of CONDOR. In the same token, considerable differences of attitude and support existed between TELESAT and the Canadian International Development Agency (CIDA) with regards to the Andean project. TELESAT, being generally more supportive of the Andean initiative, claimed to be surprised for the lack of interest in this project shown by CIDA officials.²³¹

In sum, multilateral development banks (basically, those in which U.S. influence predominate), as well as, some individual countries' development agencies are skeptical that expensive solutions like the Andean system constitute the right way to approach the Andean telecommunication deficiencies. To them, simpler solutions, like gradual microwave network expansions, could be more appropriate. However, as Heather Hudson pointed out:

For many rural areas, especially those in more remote locations or separated by more rugged terrain, satellite communication may be significantly more economical than terrestrial alternatives. In most cases, the least-cost solution will involve a hybrid system combining satellite and terrestrial technology.²³²

Thus, not surprisingly, for funding and technological assistance, the Andean Pact seems to be placing most of their hopes in the European Economic Community. After all, as a common market itself, the EEC tends to better understand the needs and dynamics of multi-country integration initiatives. So far, the EEC has responded more expeditiously to the Andean expectations: first, by financing CONDOR's second feasibility study, and more recently, by offering funds and assistance for the spacecraft's engineering design.

Political Reasons

For the Andean community, CONDOR represents two important political achievements: emerging as the first multicountry-owned satellite system of the American continent and, having an effective presence in the South American portions of the geostationary orbit (mostly occupied by North American Satellites).

For Colombia and Ecuador, in particular, the regional satellite is even more significant. It constitutes both the final materialization of a long waited dream (having a satellite), and a giant step towards defending their claims of space sovereignty over "their" national segments of the GSO. In fact, with CONDOR in orbit, these two Andean

countries would be greatly contributing to the cause of the Equatorial countries' perspective.

For more than a decade, Colombia and Ecuador, along with seven other Equatorial countries of Africa and Asia (Indonesia, Kenya, Zaire, Congo, Uganda, Gabon and Somalia), have demanded rights of sovereignty over the continental portions of the GSO. As Indalecio Lлевano, Colombian Ambassador to the United Nations, originally pointed out, introducing this claim before the XXX UN General Assembly on October 13, 1975:

... Colombia does not object, from any height to the infinite, the free orbital transit required by communication artifacts approved and authorized by the International Telecommunication Convention; when those artifacts go through the national territory as part of their gravitational flight. But, Colombia clearly objects the case of devices intended to be permanently fixed on its segment of the geostationary orbit, because it considers such a segment as one of its natural resources being always part of the third dimension of its full sovereignty.²³³

This approach was adopted in the 1976 Bogota Declaration, signed by the Equatorial countries--except Brazil and the tiny Republic of Nauru--during their first summit held in Bogota, Colombia. In dealing with the Equatorial countries' claim of sovereignty, it is essential to note that there is neither a valid legal definition nor a delimitation between aerospace and outer space in international law. This legal vacuum became the strongest argument of the Equatorial nations, since, not existing a clear, uniform and globally recognized frontier between airspace and outer space within

the international community, they felt entitled to protect their full national sovereignty according to principles inspired in domestic constitutional provisions.

The Bogota Declaration signatories defined the legal implications of their claim as follows:

The devices to be placed permanently on the segment of a geostationary orbit of an Equatorial state shall require previous and expressed authorization on the part of the concerned state, and the operation of such device should conform with the national law of that territorial country over which it is placed. It must be understood that the said authorization is different from the coordination requested in cases of interference among satellite systems...The said authorization refer in very clear terms to the countries' right to allow the operation of fixed radio communication stations within their territory.²³⁴

Expressing their discontent with the presence of permanent foreign satellites deployed above their territories, the declaration added:

Equatorial states do not condone the existing satellites or the position they occupy on their segments of the geostationary orbit, nor does the existence of said satellites confer any rights of placement or use of the segment unless expressly authorized by the state exercising sovereignty over this segment.²³⁵

The immediate objection against the Equatorial countries' declaration was that its demands were based on the evocation of an exclusive and absolute right of sovereignty over the GSO; something which raised utmost reactions, particularly from most of the signatories of the 1967 Outer Space Treaty. They argued that the principle of non-national appropriation of outer space by claim of sovereignty, by means of use or occupation or by any other means (as stated in the treaty),

was already a traditionally accepted notion in international law. Thus, since the Outer Space Treaty has been ratified by approximately 84 countries (including two Equatorial ones), it was said that these countries were also legally bound to follow such a concept with respect to the GSO also.

The Equatorial nations, however, firmly defended their claim of sovereignty by refusing to recognize the text of the Outer Space Treaty as the final word in this controversial subject. On June 23, 1977, referring to the flaws and defects of the Outer Space treaty, a Colombian official remarked that the absence of a clear definition of the term "outer space" automatically made Article 2 in this treaty totally inoperative.

In this issue many questions remain unanswered. For example, what is it exactly that can not be appropriated? Is there any difference to have the GSO at 200 km from the earth instead of 36,000 km, when nobody seems to know where aerospace ends and where outer space begins? The Bogota Declaration made their point in the following terms:

There is no valid or satisfactory definition of outer space which may be advanced to support the argument that the geostationary orbit is included in the outer space ... Therefore, it is imperative to elaborate a juridical definition of outer space, without which the implementation of the treaty of 1967 is only a way to give recognition to the presence of the states that are already using the geostationary orbit.²³⁶

As the Equatorial countries have noted, the way this treaty is written does not unequivocally include the GSO as part of the outer space; hence, efforts trying to demonstrate

the illegitimacy of the Equatorial nations' claim as related to the Outer Space Treaty are legally groundless. As Benko, De Graaf and Reijnen pointed out:

... it can not be maintained that the Equatorial countries' claim is incompatible with the express wording of the Outer Space Treaty, since the treaty does not deal with the delimitation question.²³⁷

And they add, "these discussions, or those of similar nature, probably could have been prevented if the question of delimitation had been settled earlier."²³⁸

In sum, for the Equatorial nations and now for the Andean Pact countries (which, since the early 1980's--particularly after CONDOR's priority status--has offered wide support to this claim) the question of space sovereignty over the GSO is a major factor in the formulation of satellite communications-related policies.

The claim, however, is no longer a demand for exclusive and absolute rights of sovereignty. After both the Second Equatorial countries' summit, held in Quito, Ecuador (April of 1982) and the 1984 Working Paper presented at the UN COPUOS by Colombia, Ecuador, Kenya and Indonesia, such demand have really become a claim for "preferential rights." As Alfredo Rey, former Director of Colombia's TELECOM office of International Affairs once observed, it is worth to:

... revise the thesis of the geostationary orbit from a more realistic perspective. We should not talk about sovereignty, rather, we should come to a special juridical regime.²³⁹

In Quito, the Equatorial countries emphasized that the GSO

should be rationally and efficiently used on the basis of regional and global cooperation. It is interesting to note how the most active Equatorial nations like Colombia, Ecuador, Indonesia and Kenya, have also played a leading role in the formation of regional satellite networks like CONDOR, the PALAPA/ASEAN system and the Regional African Satellite Communication project (RASCOM), respectively.

In addition to the influential national sovereignty concerns, the Andean Pact countries were also encouraged to endorse the CONDOR project by strong national security interests. Although this element has been little discussed in ASETA (due to its delicate and rather internal nature), it is nonetheless a definite factor. As Velasquez years ago observed, "another of the little mentioned applications, where this technology [satellites] proves to be very effective, is the support of civil and national defense programs, facilitating the integration of bordering towns."²⁴⁰

In fact, on the one hand, CONDOR represents for every Andean state an ideal tool to reaffirm national sovereignty in border zones (mainly, those conflicting areas like the Amazon jungle), and on the other, the regional satellite may be a useful instrument to improve anti-guerrilla and anti-drug trafficking warfare throughout the Andean territories.

Certainly, in 1979, Colombia built its first domestic satellite antennas in the Caribbean island of San Andres and

the Amazon river port of Leticia. In the case of San Andres, the intention was to show the Nicaraguan government--which at that time had claimed sovereignty over these islands--that the archipelago was very much connected and part of the Colombian state; in Leticia, the goal was to neutralize the increasing influence of Brazilian television in this area.

Being affected by internal public order and border tensions, military uses of domestic satellite services are thus of great interest for the Andean Pact countries. In this subject, it is good to remember, as Mattelart and Schmucler did, that INTELSAT limits the use of its network to public telecommunications excluding military or national security-related information. A regional system like CONDOR would therefore allow Andean governments to utilize the satellite network at their convenience and with extreme flexibility.²⁴¹

Finally, the question of national security partially leads to another politically influential reason favoring the CONDOR project: independence from an external agency in the provision and management of national and intra-regional satellite communications (in few words, independence from INTELSAT, or from any other foreign satellite carrier for that matter). Dissatisfactions with bureaucratic and technical complexities involving INTELSAT domestic leases (coming not exclusively from the Andean Pact countries), have raised themselves as a major reason for wanting a self-run and more autonomous satellite organization.

Cultural-related Reasons

In spite of undeniable subregional differences and internal tensions, in the end and comparing with other regions of the world, the relative cultural homogeneity of the Andean Pact nations in terms of language, religion, ethnic background and, more importantly, political heritage, make these countries culturally permeable to the values of regional unity and integration. As Ferreira and Mody noted, the desire for greater independence from external agencies and greater political autonomy for this area, is a strong traditional sentiment dating back to the times of Simon Bolivar.

Communication integration and, thus, projects like CONDOR, are seen as key strategic steps towards reaching greater levels of regional cohesion and wider political sovereignty as nation-states. Past experiences like that of the adoption of color television standards in the early 1980's, taught the ASETA countries that the lack of Andean unity refrained them from responding more adequately to pressures of foreign multinationals, and to power-bargaining dynamics in equipment acquisition and technology transfer negotiations. As Raquel Salinas noted, an isolated Andean country lacks market to push for better transaction terms, but the combined subregional market is a different matter. For this scholar, Andean unity in telecommunications policy (as in all other areas of international relations), has proven to be an

indispensable factor for increased negotiating power.²⁴²

For ASETA, the highly needed sense of regional identity, unity, and cohesiveness can not be reached with poor levels of mutual communication. In this context, CONDOR project is thus felt to be an essential tool for the promotion of mutual awareness and knowledge among Andeans, through widespread entertainment, cultural and educational transmissions. As Jaime Aguilera remarked, communications "have a great responsibility in the process of rescuing our Andean identity and in promoting integration as a fundamental part of such identity."²⁴³

In brief, major reasons for the adoption of Andean CONDOR on geographic, technical, political, and cultural grounds are: the persistent communication difficulties derived from the complex geography; the technical advantages of having a truly dedicated and powerful enough satellite serving the subregion; the possibility of having an effective presence in the GSO to carry on the members' claims; the foreseen contributions of the regional satellite network in terms of national sovereignty and national security; the opportunity to gain greater levels of autonomy and independence in running their own internal satellite communications; and finally, the immense potential of the regional system for education, literacy, health, agricultural extension, socio-economic development, political and cultural integration purposes.

All in all, a powerful source of potential changes in the original schedule of the regional satellite plan (and most probably, of further delays) is the economic factor. In fact, a major reason against CONDOR continues to be its unclear economic profile, specially in terms of future demand, service costs and profitability levels to maintain the system.

CONCLUSION

Historical, geographic, technical and political evidence tend to demonstrate that the Andean Pact countries do have enough reasons for launching a regional communications satellite of their own.

In fact, common subregional telecommunication difficulties derived from geography; comparable development, political and cultural needs and expectations in terms of domestic and intra-regional satellite communications; a clear regional governmental commitment to the Andean satellite project; and, reasonable technical justifications for having a regional dedicated satellite network, show that project CONDOR indeed deserved the priority status it received in 1984.

For the Andean subregion, the CONDOR project is neither an overnight program nor an artificially created need. For almost fifteen years, the Andean Pact countries have been discussing its implementation. Likewise, the use of satellite-based infrastructure and equipment is not new for any of the participating members (including Bolivia).

Furthermore, for the Andean Pact states, the satellite system embodies important subregional aspirations, namely: that the long-hoped presence of the Andean world in the GSO will be finally materialized; that the Bolivarian spirit of cooperation, which this project symbolizes, will prove its

strength; and, that the assumed contributions of using more capable and more autonomous communication technologies in the subregion, will start to yield positive results.

Project CONDOR, however, faces the obvious obstacle of every major Third World initiative: lack of funds. Thus, the Andean program's basic weaknesses appear to be: the still unclear financial prospects of the future Andean satellite organization OATS; the so far poor involvement of the subregional private sector in designing, shaping and implementing the satellite system (as critical potential users); and, the persistent low levels of information with respect to CONDOR in major non-communication Andean domestic public offices, universities, research centers, the mass media and the general public (as future potential users and/or evaluators).

ENDNOTES

1. A subregional process of socio-economic, political and cultural integration officially known as the Acuerdo de Cartagena, inaugurated by the Andean countries (except Argentina) on May 26, 1969. Venezuela joined the Pact in 1973 while Chile withdrew in 1976.

See, "Acuerdo de Cartagena," in Pacto Andino: Textos Fundamentales, (Bogota, Colombia, Ediciones Colatina, 1979), pp. 131-190.

2. Named after the big bird of the Andes, symbol of this geographical region.

3. See, Bella Mody, "Contextual Analysis of the Adoption of a Communications Technology: the Case of Satellites in India," (Telematics and Informatics, vol. 4, no. 2, 1987) pp. 151-158; Jorge Borrego and Bella Mody, "Contextual Analysis of Adoption of a Communications Technology," (Telecommunications Policy in press); and Leonardo Ferreira and Bella Mody, "Contextual Analysis of the Decision to Adopt a Regional Satellite System: the Case of CONDOR," (paper presented at the Sixteenth Telecommunications Policy Research Conference, Airlie House, Virginia, November, 1988--in press, Chasqui: The Latin American Journal of Communication, 1989), pp. 1-16.

4. Physical integration including telecommunications, was one of the eight principal areas of subregional cooperation identified in the Re-orientation Plan of the Cartagena Agreement. See, Junta del Acuerdo de Cartagena (JUNAC), "Plan de Reorientacion del Proceso Andino de Integracion," (Reorientation Plan of the Andean Integration Process, COM/XXXV-E/dt 3, Rev. 2, July 9, 1983 and COM/XXXV-E/dt 2, July 26, 1983).

5. LAFTA was created in February 18, 1960. On August 12, 1980, LAFTA was replaced by the Latin American Integration Association (LAIA).

6. Bolivia lost her only coastal province (Antofagasta) to Chile during the Pacific War (1873-1883).

7. Servicio de Informacion y Documentacion de Bolivia (SIDBOL), Cronologia Economico-Politica (Economic-Political Chronology, La Paz, Bolivia/Bogota, Colombia, June 1987),

p. 7.

8. Mestizos have white and native indian blood ties, while mulattos come from white and black racial backgrounds. For demographics and population figures in the Andean area, see Junta del Acuerdo de Cartagena (JUNAC), "Estadísticas Demograficas" in Compendio Estadístico del Grupo Andino (1980-1986), (Statistical Compendium of the Andean Pact, J/UI.ES/038, November 9, 1987) pp. 3-10; and JUNAC, "Demografía," in Indicadores Socio-Economicos (1970-1979), (Socio-Economic Indicators, Lima, Peru: Sistema Subregional de Información Estadística, 1981), pp. 2a-19.

9. Based on statistics published in George Thomas Kurian, Encyclopedia of the Third World, (vols. I-III, Oxford, England: Facts on File Inc., 1987); South American Economic Handbook, (London: Euromonitor Publications Ltd., 1986) by countries; and, JUNAC, Compendio Estadístico del Grupo Andino (1980-1986).

10. John K. Mayo, Gary R. Heald, Steven J. Klees and Angel Velasquez, "Rural Satellite Communications in Peru," Intermedia (vol. 15, no. 3, May 1987), p. 46.

11. The Aymara Language and its Social and Cultural Context, edited by M.J. Hardman, (Gainesville, FL: University Presses of Florida, 1981), pp. 6-7, 271. Also, see Alfredo Torero, El Quechua y la Historia Social Andina, (La Habana, Cuba: Editorial de Ciencias Sociales, 1980), pp. 1-4.

12. See, "Education" under each Andean Pact country in Encyclopedia of the Third World.

13. Under Pachacutec (1438-1471), the Inca empire reached maximum expansion. Having its capital in Cusco, the Tahuantinsuyo was then formed by four major domains: Collasuyo (Bolivia, lower Southeastern Peru, Central and Northern Chile and Northwestern Argentina); Antisuyo (upper Southeastern Peru); Contisuyo (Southwestern Peru); and Chinchaysuyo (Central and Northern Peru, Ecuador, and Southwestern Colombia). See Jose Bonilla, Peru Pre-Hispanico, (Lima, Peru: Ediciones Kuntur, 1983), p. 102.

14. Lawrence A. Clayton, The Bolivarian Nations of Latin America, (Arlington Heights, IL: The Forum Press, 1984), p. 8.

15. Jose Luis Salcedo-Bastardo, Bolivar: a Continent and its Destiny, (Richmond/Surrey, England: The Richmond Publishing Company, 1977), pp. 85-86.

16. Leonardo Ferreira and Bella Mody, "Contextual Analysis of the Decision to Adopt a Regional Satellite System: The Case of the Andean CONDOR," p. 13.
17. Carlos Castro, "The Role of the Andean Satellite Communication System Or: Will the 'CONDOR' Fly High in the Andean Skies?" (Paper presented at the Pacific Telecommunications Conference, Honolulu, Hawaii, 1979), p. 1.
18. JUNAC, "Estadísticas de Comercio Exterior," in Compendio Estadístico del Grupo Andino (1980-1986), p. 16.
19. JUNAC, Compendio Estadístico del Grupo Andino (1980-1986), p. 74.
20. "Bolivia," Encyclopedia of the Third World, vol. 1, p. 212.
21. "Continuarán Decreciendo Países del Pacto Andino," Excelsior, Mexico, D.F, March 12, 1988, p. 2.
22. World Development Report 1987, table 22, p. 244.
23. PQLI is an ascending scale in which a value of 100 is the maximum. It measures a country's level of social development based on an average of life expectancy at age one, infant mortality and literacy.
24. Encyclopedia of the Third World, vol. 1, pp. 585, 589; "Continuarán Decreciendo Países del Pacto Andino," Excelsior (Andean Pact Countries Will Continue Decreasing, March 12, 1988), p. 2.
25. Ibidem.
26. Venezuela played a leading role in the creation of this international oil cartel. "Venezuela," Encyclopedia of the Third World, vol. 3, p. 2105; and, JUNAC, Compendio Estadístico del Pacto Andino (1980-1986), p. 17.
27. Departamento Administrativo Nacional de Estadística, "Estadísticas Latinoamericanas," Colombia Estadística 86, (Bogota, Colombia: DANE, 1987), p. 948; Encyclopedia of the Third World, p. 2101; and "Continuarán Decreciendo Países del Pacto Andino," Excelsior, March 12, 1988, p. 2.
28. Ministerio de Información y Turismo, La Cooperación Internacional de Venezuela (Caracas, Venezuela: Imprenta Nacional, 1982), pp. 73, 98.

29. JUNAC, Compendio Estadístico del Grupo Andino (1980-1986), p. 43.

30. "Cuanto Gana la Gente," Semana, (How Much People Earn, Bogota, Colombia, August 9, 1988), p. 33; and "Colombia," Encyclopedia of the Third World, vol. 1, p. 447.

31. Douglas Goldschmidt, "Financing Telecommunications for Rural Development," Telecommunication Policy (September 1984), p. 184.

32. Interview with Miguel de la Rosa, ASETA's Director of the Satellite Affairs Department, in "Sistema Andino de Telecomunicaciones por Satelite (Proyecto CONDOR)," ASETA Informativo (Andean Telecommunications Satellite System, vol. 1, no. 2, June 1987), pp. 1-2.

33. See, "Definitions and Data Notes," in World Development Report 1987, xi.

34. Allan Wagner, "EEC Urged to Provide Aid for Andean Pact," (Inter-American Affairs, FBIS index, October 31, 1985), p. A-1.

35. JUNAC, Compendio Estadístico del Grupo Andino (1980-1986), p. 67, and Encyclopedia of the Third World, p. 2102.

36. Ibidem.

37. Ibidem.

38. Ibidem.

39. Ibidem.

40. The highest authority of the Cartagena Agreement. It is formed by the plenipotentiary representatives--one principal and one alternate--from each Andean member country.

41. Junta del Acuerdo de Cartagena, "El Grupo Andino: Evolucion y Perspectivas," (The Andean Group: Evolution and Perspectives JUN/di 899, Lima, Peru, April 26, 1985), pp. 11-15; and, "Nuevo Impulso al Grupo Andino," (New Impulse to the Andean Group, Vision, Vol. 68, no. 12, Mexico, D.F., June 15/29, 1987), p. 39.

42. JUNAC, Compendio Estadístico del Grupo Andino (1980-1986), pp. 18, 51.

43. Jaime Aguilera, "Las Telecomunicaciones en el Pacto Andino," Integración y Comunicación (Telecommunications in the Andean Pact, symposium, Bogota, Colombia, November 25-29, 1985), p. 5.
44. Interview with Sergio Martinez, General Secretary of the Ministry of Communications of Colombia, December 22, 1987.
45. General Gustavo Rojas Pinilla seized power in 1953, overthrowing the Conservative president Laureano Gomez.
46. An internal war originally developed among Liberals and Conservatives and later transformed into a class political struggle of greater dimensions. It took place between 1948 and 1957, costing Colombia more than 300,000 deaths.
47. Independent Electoral Political Organization Committee.
48. Beginning 1948, 10 years of repressive military governments dominated Venezuela's political life, most notably, the one commanded by a career army officer named Marcos Perez Jimenez (1952-1958).
49. It refers to the charismatic and traditional movement headed by the five-times president Jose Maria Velasco Ibarra (1934, 1944, 1952, 1960 and 1968).
50. "Latin America: Not Again, Please," The Economist (August 20, 1988), pp. 35-36.
51. Revolutionary Nationalist Movement.
52. Lawrence Clayton, The Bolivarian Nations of Latin America, p. 60.
53. Popular and Democratic Unity.
54. The most active groups in the subregion today are the Fuerzas Armadas Revolucionarias de Colombia (FARC), the Movimiento 19 de Abril (M-19), and the Ejercitos de Liberación Nacional (ELN) and Popular de Liberación (EPL) in Colombia, and Sendero Luminoso (Shining Path) in Peru.
55. Mayo, Heald et. al., "Rural Satellite Communications in Peru," p. 46.
56. "Guerra del Grupo Andino a Narcos," Excelsior (War from the Andean Pact to Narcos, March 22, 1988), p. 2.
57. El Tiempo, "Tranquilandia, la Mayor Derrota del Cartel," (Tranquilandia, the Biggest Defeat of the Cartel, December 9, 1987), p. 8-A.

58. "El Pacto Andino Salvo Su Crisis Politica, Dice Gutierrez Zalles," Excelsior (The Andean Pact Saved Its Political Crisis, Gutierrez Zalles Said, March 1, 1988), p. 2.

59. Exit to the sea.

60. Cartagena Agreement, reprinted in Pacto Andino: Textos Fundamentales, p. 172. Translated by the author.

61. Forero, pp. 75-76.

62. Heather Hudson, "Access to Information Resources: the Developmental Context of the Space WARC," in Tracing New Orbits (edited by Donna A. Demac, table 14.2, Columbia University Press, New York, 1986), pp. 212.

63. Forero, pp. 78-79.

64. Ibidem, p. 78.

65. Armand Mattelart and Hector Schmucler, America Latina en la Encrucijada Telematica (Latin America in the Telematic Crossroad, Buenos Aires, Argentina, Editorial Paidos, 1983), p. 75.

66. Jeff Fobes, "An Overview of Informatics and Development," Telematics and Informatics (table 1, vol. 4, no. 3, 1987), pp. 184-185; and Leonardo Ferreira and Joseph Straubhaar, "Radio and the New Colombia," Journal of Popular Culture (vol. 22, no. 1, Summer 1988), p. 133.

67. Daniela U. Migliorini and Orlando Luna, "La Informatica en Venezuela," Comunicacion (no. 46, Caracas, Venezuela, June 1984), p. 12; Forero, p. 83.

See also, Ministerio de Comunicaciones, Red Publica Nacional de Transmision de Datos de Colombia-COLDAPAO (Bogota, Colombia: Oficina de Prensa, n.d.).

68. SAYCIT stands for Automated System of Scientific and Technological Information.

69. Instituto para America Latina (IPAL), "Informatics in Education in Peru" NTC/NCT Newsletter (vol. 2, n. 6, Centro de Estudios sobre Cultura Transnacional, Lima, Peru, June, 1987), p. 20.

70. "Andean Information Network," NTC/NCT Newsletter (vol. 1, No. 3, August 1986), p. 23.

71. Technological Information System.

72. "The Mechanization of the Andean System of Technological Information," NTC/NCT Newsletter (vol. 1, no. 3, August 1986), p. 24.

73. Forero, table 3.1, p. 62.

74. "Development of Informatics in Latin America" NTC/NCT Newsletter (vol. 1, No. 3, August 1986), pp. 3, 5.

75. Forero, tables 3.5-3.10, pp. 65-70.

76. "An Overview of Cable Television in Latin America," NTC/NCT Newsletter (vol. 1, no. 4, January 1987), pp. 3, 7.

77. Hector Schmucler, "25 Anos de Satelites Artificiales," Comunicacion y Cultura (25 Years of Artificial Satellites, no. 9, Universidad Autonoma Metropolitana-Unidad Xochimilco, 1983), pp. 59-61.

78. The domestic stations are Acandi, Arauca, Bahia Solano, Barranquilla, Cerrejon, Choconta-2, Choconta-4, Leticia, Mitu, Puerto Carreno, Puerto Inirida, Puerto Leguizamo, San Andres-1, San Andres-2, and San Vicente del Caguan. INTELSAT, "Annual Report of the Earth Station Implementation Schedule," (attachment no. 3, Washington, D.C., December 31, 1987), p. 5, 24, 28; and ITU, 15th/19th/20th/21st/23rd/24th Report by the International Telecommunication Union on Telecommunication and the Peaceful Uses of Outer Space (Booklets nos. 23/27/29/30/32/33, Geneva: ITU, 1976-1985).

79. Ligia Ma. Fadul, "Las Comunicaciones Via-Satelite en America Latina," Cuadernos del Ticom (Via Satellite Communications in Latin America, Mexico D.F., Universidad Autonoma Metropolitana-Xochimilco/Taller de Investigacion de Comunicacion Masiva, February 1984), p. 36; and ITU, 21st Report, 1982), p. 92.

80. The domestic stations are: Caballococha, Chachapoyas, Contama, Iquitos, Juanjui, Lurin-2, Pucallpa, Saposoa, Tarapoto and Tocache. INTELSAT, "Annual Report of the Earth Station Implementation," p. 14, and ITU, 23rd. Report, booklet no. 32, p. 115.

81. Fadul, p. 38; John K. Mayo, Gary R. Heald, Steven J. Klees and Angel Velasquez, "Rural Satellite Communications in Peru," Intermedia (vol. 15, no. 3, May 1987), p. 40; and Clifford Block, Douglas Goldschmidt, Anwar Hafid, Gerald C. Lalor and Angel Velasquez, "Satellite Telecommunications for Development: the AID Rural Satellite Program and its Pilot Projects in Indonesia, Peru and the Caribbean," Pacific

Telecommunications Conference Proceedings, (Honolulu, Hawaii, 1984), p. 19.

82. INTELSAT, "Annual Report," pp. 22, 32.

83. Ibidem, and Fadul, p. 39.

84. INTELSAT, "Annual Report," p. 29; and ASETA, "Acta de la XIV Reunion de la Junta Directiva de la Asociacion de Empresas Estatales del Acuerdo Subregional Andino," (Minute of the XIV Meeting of ASETA's Board of Directors, Panama city, Panama, Febrero 1983), p. 11.

85. Schmucler, pp. 61-62.

86. FBIS, "Decision to Purchase INTELSAT Equipment Criticized," FBIS Index (Peru, February 26, 1987), p. J-7.

87. ITU, 21st Report, p. 233, and Agency for International Development, AID Rural Satellite Program, (table 7, Washington D.C., AID/Academy for Educational Development, Inc., June 1981), p. 22.

88. The Andres Bello Covenant is the educational, scientific and cultural branch of the Andean Pact.

89. Andres Bello Covenant, arts. 10, 29 and 30, reprinted in Pact Andino: Textos Fundamentales, p. 194, 199.

90. Andres Bello Covenant, art. 31, ibidem, p. 199, 200. Translated by the author.

91. Latin American Regional Education System.

92. Advanced Study of Communications for Education and National Development.

93. CAVISAT means Via Satellite International Audio-Visual Center. For more information on CAVISAT, See, Luis Ramiro Beltran and Elizabeth Fox de Cardona, "Latin America and the United States: Flaws in the Free Flow of Information," in National Sovereignty and International Communication (edited by Kaarle Nordenstreng and Herbert I. Schiller, Norwood, New Jersey, Ablex Publishing Corporation, 1979), p. 46; and Armand Matellart, Agresion Desde el Espacio (Aggression from Space, 9th edition, Bogota, Colombia: Editorial Siglo XXI, 1985), p. 34.

94. Coloquio Latinoamericano Sobre Reforma Educativa (Latin American Colloquium on Educational Reform, Mexico, October 1972), quoted by Enrique Santos, "Tecnologia, Imperialismo y Educacion," Comunicacion y Cultura (Technology, Imperialism

and Education, no. 3, Mexico, Universidad Autonoma Metropolitana-Unidad Xochimilco, 1986), p. 135. Translated by the author.

95. Inter-American Telecommunications Conference.

96. Edward Ploman, "A Guide to Satellite Communication," Reports and Papers on Mass Communication (no. 66, Paris, UNESCO, 1972), pp. 15, 24. See also Wilbur Schramm, "Communication Satellites for Education, Science and Culture," Reports and Papers on Mass Communication (no. 53, Paris, UNESCO, 1968).

97. Roberto Ballochi, "Algunos Antecedentes Sobre el Satelite Educativo Para America del Sur," Comunicacion y Cultura (Some Antecedents on the Educational Satellite for South America, no. 3, 1986), pp. 117-121.

98. "Diseno y Metodologia del Estudio de la Viabilidad de un Sistema Regional de Teleduccion para los Países de America del Sur," printed in Comunicacion y Cultura (Design and Methodology for the Feasibility Study of a Regional Tele-education System for the Countries of South America, no. 3), pp. 147-167.

See also, Luis Ramiro Beltran and Elizabeth Fox de Cardona, Comunicacion Dominada (Mexico, D.F., Editorial Nueva Imagen, 1980).

99. See, Angel Velasquez, "Estudios de Factibilidad sobre un Sistema Regional de Satelites para los Países Andinos," (Feasibility Studies on a Regional Satellite System for the Andean Countries, DOC. IGP-04/DICPE-78, Instituto Geofisico del Peru/Direccion de Investigacion Cientifica-Proyectos Especiales, Lima, Peru, February 1978), p. 4.

100. Hector Torres, "Colombia y El Satelite Educativo," Comunicacion y Cultura (Colombia and the Education Satellite, no. 3), p. 126.

101. Association of State Telecommunication Enterprises of the Andean Subregional Agreement.

102. Beginning in 1984, these Andean summits were renamed as meetings of Andean Ministers of Transportation, Communications and Public Works.

See, II Reunion de Ministros de Transportes y Obras Publicas del los Países Miembros del Acuerdo de Cartagena (Minute of the II Meeting of Ministers of Transportation and Public Works of the Member-Countries of the Cartagena Agreement, Caracas, Venezuela, July 13-15, 1983), p. 17.

103. The English translation of these acronyms are as follows: ENTEL-Bolivia (National Telecommunications Enterprise of Bolivia), TELECOM (National Telecommunications Enterprise of Colombia), IETEL (Ecuadorian Telecommunications Institute), ENTEL-Peru (National Telecommunications Enterprise of Peru), and CANTV (National Limited Telephone Company of Venezuela).

104. Junta del Acuerdo de Cartagena, "El Proceso de Integracion en America Latina en 1983: El Grupo Andino," (The Integration Process in Latin America in 1983: The Andean Group, JUN/di 837, September 24, 1984), pp. 5, 7.

105. Junta del Acuerdo de Cartagena, "Para Nosotros la Patria es America," (To Us Our Nation is America, art. 10, JUN/di 743, August 10, 1983), p. 4. Issued as part of the celebration of Simon Bolivar's 200th birthday.

106. See, Junta del Acuerdo de Cartagena, "Acta Final de la Sexta Reunion del Consejo de Integracion Fisica," (Final Minute of the VI Meeting of the Physical Integration Council, C.IF/VI/Acta Final, Caracas, Venezuela, July 13, 1983); and II Reunion de Ministros de Transportes y Obras Publicas de los Paises Miembros del Acuerdo de Cartagena (II Meeting of Ministers of Transportation and Public Works, Resolution 2.16 as annexed, July 15, 1983).

107. The Physical Integration Council is a technical subregional forum created in 1973, which contributes to the formulation of Andean actions and investments policies in the transportation and communication areas. The Council has been concentrated mostly in the transportation sector.

108. For discussions on relationships between physical space, subregional development and communications, see Hernan Latorre, "La Integracion Andina en el Contexto del Pacto Andino," Nueva Sociedad (Andean Integration in the Context of the Andean Pact, San Jose, Costa Rica, July-October 1975), pp. 39-55.

109. Junta del Acuerdo de Cartagena, "Estrategia Andina de Desarrollo en el Area de la Integracion Fisica: Sectores de Transportes y Comunicaciones" (Andean Development Strategy in the Area of Physical Integracion: Transportation and Communications Sectors, excerpts, n.d.), pp. 19, 21.

110. ASETA, "Acta de la XIV Reunion de la Junta Directiva de la Asociacion de Empresas Estatales de Telecomunicaciones del Acuerdo Subregional Andino" (Minute of the XIV Meeting of ASETA's Board of Directors, Panama, Panama, 1983) p. 7; and Clemente Forero, Informatica e Integracion Economica (Informatics and Economic Integration, Bogota, Colombia,

Tercer Mundo Editores, November 1987), p. 84.

111. ASETA, "Informe del Secretario General a la XVI Reunion de la Junta Directiva de la Asociacion de Empresas Estatales de Telecomunicaciones del Acuerdo Subregional Andino," (Report of the Secretary General to the XVI Meeting of ASETA's Board of Directors, Bogota, Colombia, September 1984), p. 16.

112. Jaime Aguilera, "Las Telecomunicaciones en el Pacto Andino," Symposium, Integracion y Comunicacion (Telecommunications in the Andean Pact, Bogota, Colombia, November 25-29, 1985), p. 8.

113. Jaime Aguilera, letter sent to Alfredo Sanchez, ENTEL-Bolivia's General Manager, (Circular, SG-005-84, Quito, Ecuador, April 26, 1984), p. 4-5.

114. The Andean Development Corporation, created on February 7, 1968--even before the Andean Pact itself--is the financial branch of the Cartagena Agreement. This entity is intended to facilitate and promote the execution of development programs inside the subregion.

115. Jaime Aguilera, letter sent to Alfredo Sanchez, ENTEL-Bolivia, p. 5; and ASETA, "Presentacion de Proyectos de Integracion en Telecomunicaciones en el Area Subregional Andina a la Comunidad Economica Europea," (Presentation of Integration Projects in Telecommunications in the Andean Subregional Area to the European Economic Community, DOC. ASETA-111, Quito, Ecuador, April 1984), p. 25.

116. Raquel Salinas, "Information in the Third World: Adjusting Technologies or Strategies?" Media, culture and Society (Sage, Beverly Hills, vol. 7, 1985), p. 362.

117. ASETA, "Acta de la XVII Reunion de la Junta Directiva de la Asociacion de Empresas Estatales de Telecomunicaciones del Acuerdo Subregional Andino (Minute of the XVII Meeting of ASETA's Board of Directors, Quito, Ecuador, April 1985), p. 5.

Translated by the author.

118. Ibidem, pp. 7-8. Translated by the author.

119. Forero, p. 78, and Ronald S. Eward, The Competition for Markets in International Telecommunications (Dedham, MA: Artech House, Inc., 1984), p. 189.

120. Forero, p. 87.

121. ASETA, "Presentacion de Proyectos de Integracion en Telecomunicaciones del Area subregional Andina a la Comunidad Economica Europea," p. 10.

122. Raquel Salinas, p. 362.

123. Andean Commission of Radio and Television.

124. Junta del Acuerdo de Cartagena, "Informe de la I Reunion de la Comision Andina de Radio y Television," (Report on the I Meeting of the Andean Commission of Radio and Television, JUN/di 904, Quito, Ecuador, May 1985), pp. 1-22.

125. Audiovisuales--advertisement, Semana (no. 254, Bogota, Colombia, March 17-23, 1987), p. 22.

126. Andean Telecommunications Workshops.

127. ASETA, "Acta de la XVII Reunion de la Junta Directiva de la Asociacion de Empresas de Telecomunicaciones del Acuerdo Subregional Andino," (Minute of the XVII Meeting of ASETA's Board of Directors, Quito, Ecuador, April, 1985), p. 7.

128. ASETA, ASETA Informativo, (vol. 1, no. 2, Quito, Ecuador, June 1987), p. 2.
See also, Foreign Broadcast Information Services (FBIS), "Integration Group Planning Andean Communication Net," FBIS Index, (Inter-American Affairs, March 20, 1987), p. A-1.

129. Jaime Nino, "Satelite y Soberania," in Las Cinco Maravillas Millonarias de Colombia (Satellite and Sovereignty, Bogota, Colombia: Editorial las Oveja Negra/FESCOL, 1982), p. 181.

130. TELECOM, "Sistema Andino de Telecomunicaciones por Satelite (SATS): Proyecto CONDOR," (Satellite Telecommunications Andean System: CONDOR Project, annex no. 1, Bogota, Colombia, Oficina Asesora para Asuntos Internacionales, November, 1986).

131. Sylvia Ospina, "Project CONDOR: An Analysis of the Feasibility of a Regional Satellite System for the Andean Pact countries," (LL.M. Thesis, Institute of Air and Space Law, McGill University, Montreal, February 1988), p. 3.27.

132. TELECOM, SATS: Proyecto CONDOR, annex 2.

133. The other three bidders were CANTEL, ADGA and Miller Communications Systems Limited.

134. ASETA, "Estudio de Factibilidad de un Sistema de Telecomunicaciones por Satelite para los Países de la Subregion Andina: Proyecto CONDOR," (Feasibility Study of a Telecommunications Satellite System for the Countries of the Andean Subregion: Project CONDOR/Spanish version of the CAL/SATEL final report, ASETA 047, Quito, Ecuador, October 1977), p. 2.
135. TELECOM, "SATS: Proyecto CONDOR," p. 2, annex, 12. (Solano was at that time working for TELECOM's Assisting Office for International Affairs).
136. Angel Velasquez, "Estudios de Factibilidad sobre un Sistema Regional de Satelites para los Países Andinos," p. 5.
137. ITU, 21st Report, 1982, pp. 193, 233.
138. The Grand Colombia refers to the historical times in which the New Granada (today, Colombia), Ecuador and Venezuela were one single nation, presided by the Liberator Simon Bolivar (1819-1830).
For comments on the Grand Colombian satellite project, see Nino, pp. 193-195.
139. TELECOM, Proyecto SATCOL: Desarrollo Cronologico del Proyecto SATCOL y las Actividades Concernientes a la Posicion de Colombia sobre la Orbita Geoestacionaria," (Project SATCOL: Chronological Development and Activities Concerning the Position of Colombia on the Geostationary Orbit, OAI-78, rev. 1, Oficina Asesora para Asuntos Internacionales, April 1979), p. 12.
140. Nino, p. 160, 195.
141. The administration of the Conservative president Belisario Betancur took office on August 7, 1982, replacing former President Julio C. Turbay. The SATCOL project had been developed during two previous Liberal governments: the Turbay (1978-1982) and Alfonso Lopez (1974-1978) administrations. See, Nino, p. 154.
142. Edmundo Lopez Gomez, Memoria del Ministro de Comunicaciones al Congreso de 1987 (Recollection from the Minister of Communications to the 1987 Congress, Bogota, Colombia: Ministerio de Comunicaciones, 1987), p. 117; and "Satelite Andino," Comunicacion (no. 46, Caracas, Venezuela, June 1984), p. 126.
143. Here, it is important to remember that the first feasibility study included Chile, a former ASETA member withdrawn from the association during its VI Board meeting in October 1977.

144. ASETA, "Informe del Secretario General a la XIII Reunion de la Junta Directiva de la Asociacion de Empresas Estatales del Telecomunicaciones del Acuerdo Subregional Andino," (Report of the Secretary General to the XIII Meeting of ASETA's Board of Directors, Lima, Peru, January, 1982), pp. 5-22.
145. ASETA, "Acta de la XIV Reunion de la Junta Directiva de ASETA," (Minute of the XIV Meeting of ASETA's Board of Directors, Panama city, Panama, February, 1983), p. 5.
146. ASETA, "Regional Andean Communications Satellite System With Shared INTELSAT-Capacity: Technical-Economic Aspects," Document ASETA-105, October, 1983.
147. Ibidem, p. 3.
148. Andean Communications System with a Satellite of Their Own.
149. ASETA, "Acta Final de la XVI Reunion de la Junta Directiva de ASETA," (Final Act of the XVI Meeting of ASETA's Board of Directors, Bogota, Colombia, September, 1984), p. 1-5.
150. Resolucion III.41, "Sistema Andino de Telecomunicaciones por Satelite" and Resolucion III.42, "Publicacion Anticipada ante la IFRB para Satellites CONDOR," (Tercera Reunion de Ministros de Transportes, Comunicaciones y Obras Publicas, Cartagena, Colombia, September 1984).
151. "Comision Andina Notifico Sistema Satelital CONDOR," El Tiempo (Andean Commission Notified CONDOR satellite System, March 31, 1985), p. 6-D.
152. ASETA, "Informacion Facilitada para la Publicacion Anticipada Segun el Apendice 4 del Reglamento de Comunicaciones Relativa a la Red Satelital Andina: Satellites CONDOR-A, CONDOR-B y CONDOR-C," (Information Facilitated for the Advance Publication, According to Appendix 4 of the Radio Regulations, Concerning the Andean Satellite Network: CONDOR-A, CONDOR-B and CONDOR-C satellites, Quito, Ecuador, 1985).
153. IFRB, "Information on Comments Received from Other Administrations and on the Progress Made in any Difficulties Following the Advance Publication of Information on Planned Satellite Networks," (Circular no. 1717, April 8, 1986).
154. ASETA, "Principales Conclusiones de la II Reunion del Comit6 Tecnico Asesor de la Comision Andina de Telecomunicaciones por Satelite," (Principal Conclusions of the II Meeting of the Assisting Technical Committee of the Andean Satellite Telecommunications Commission, Quito,

Ecuador, October, 1985),
p. 4.

155. Jaime Aguilera, Letter to Richard Colino (former Director General of INTELSAT, Quito, Ecuador, June 27, 1985); and Telex from ASETA to INTELSAT (no. E-198-86, Quito, Ecuador, September 1, 1986).

156. ASETA, "Informe sobre los Avances del Proyecto Sistema Andino de Telecomunicaciones por Satelite," (Report on the Advances of the Project Andean Telecommunications Satellite System, Issue no. 2, XVIII Meeting of the ASETA's Board of Directors, Cusco, Peru, June 1985), p. 8.

157. ASETA, "Acta de la XIV Reunion de la Junta Directiva de la Asociacion de Empresas Estatales de Telecomunicaciones del Acuerdo Subregional Andino," p. 17.

158. TELECOM, "Sistema Andino de Telecomunicaciones por Satelite: Proyecto CONDOR," p. 6; and Joseph N. Pelton, Letter to Bella Mody (October 12, 1988). ASETA, telex no. E-198-86, Quito, Ecuador, September 1, 1986.

159. The CTA is a committee formed by experts in satellite communications engineering and economics from the five Andean administrations. It is a technical support group for the activities of the ASETA-created Andean Telecommunications Satellite Commission to be referred later.

160. ASETA, "Principales Conclusiones de la II Reunion del Comit  Tecnico Asesor de la Comision Andina de Telecomunicaciones por Satelite," p. 2.

161. TELECOM, "Sistema Andino de Telecomunicaciones por Satelite: Proyecto CONDOR," p. 7.

162. Joseph Pelton, Letter sent to Bella Mody, October 12, 1988.

163. See Europe and the Andean Countries (edited by Ciro Angarita and Peter Coffey, London, Pinter Publishers Limited, 1988).

164. "Francia Ofrece Amplia Cooperacion," El Colombiano (France Offers Extensive Cooperation, Medellin, Colombia, October 8, 1984), in TELECOM, La Orbits Geoestacionaria y las Telecomunicaciones por Satelite en la Prensa Colombiana, (Vols. 1-2, Bogota, Colombia: Oficina Asesora para Asuntos Internacionales, January 1986), p. 543.

165. ASETA, "Informe sobre los Avances del Proyecto Sistema Andino de Telecomunicaciones por Satelite," p. 3.

166. "Colombia Descarta Satellite Recuperado por el Discovery," El Espectador (Colombia Dismisses Satellite Recovered by Discovery, February 24, 1985), p. 3.

167. See, TELESAT-Canada, "Acquisition Costs of Westar VI for Ownership by One or All Andean of Andean Countries," (September 1985); and ASETA, Letter addressed to TELESAT-Canada, in "Principales Conclusiones de la II Reunion del Comité Técnico Asesor de la Comisión Andina de Telecomunicaciones por Satellite (CATSAT), annex no. 6.

168. TELECOM, "Sistema Andino de Telecomunicaciones por Satellite: Proyecto CONDOR," p. 33.

169. ESCO, "Recommendations," (Excerpts from a feasibility study for a regional satellite in the Andean subregion, September 1986), p. 1.

170. Alvaro Leal, "Satellite CONDOR," El Colombiano (Medellin, Colombia, June 26, 1988), p. 3B.

171. ASETA, "Presentacion de Proyectos de Integracion en Telecomunicaciones del Area Subregional Andina a la Comunidad Economica Europea," p. 27; and Leonardo Ferreira and Bella Mody, "Contextual Analysis of the Decision to Adopt a Regional Satellite System: the Case of the Andean CONDOR."

172. Leal, El Colombiano, p. 3-B.

173. Personal interview , Washington D.C., November 3, 1988.

174. ASETA Informativo, Vol. 1, no.2, June, 1987, p. 2.

175. "Colombia y Venezuela: Direccion y Sede del CONDOR," El Tiempo (Colombia and Venezuela: CONDOR's General Manager and Headquarters, March 29, 1988), p. 3.

176. Leonardo Ferreira and Bella Mody, p. 9; ASETA, "Presentacion de Proyectos de Integracion en Telecomunicaciones del Area Subregional Andina a la Comunidad Economica Europea," p. 27.

177. Horizon House-Microwave, "ASETA (Andean Nations)," Worldwide Communications Satellite Systems 1978-1988 (Horizon-International House, 1978), 6.13.

178. TELECOM, "Sistema Andino de Telecomunicaciones por Satellite: Proyecto CONDOR," pp. 33-34 and annex. 14, p. 4.

179. ASETA, "XVII Reunion de la Junta Directiva de la Asociacion de Empresas Estatales de Telecomunicaciones del Acuerdo Subregional Andino," p. 11.

180. TELECOM, "Sistema Andino de Telecomunicaciones por Satelite: Proyecto CONDOR," p. 35.
181. Corporacion Andina de Fomento, Carta de la CAF, (no. 53, Caracas, Venezuela, July-August, 1982.
182. TELECOM, Sistema Andino de Telecomunicaciones por Satelite: Proyecto CONDOR, annexes no. 2, 9.
183. ASETA, Sistema Regional Andino de Comunicaciones por Satelite con Capacidad INTELSAT Compartida, p. i-iv and annexes a-e.
184. ESCO, "Economical Comparison," (excerpts, a feasibility study for an Andean regional communications satellite for the Andean countries), 3.1.2; ITU, 21st Report, p. 233; and FBIS, "Decision to Purchase INTELSAT Equipment Criticized," p. J-7.
185. "No Hay Alternativa al Satelite CONDOR," El Tiempo (There is No Alternative to CONDOR Satellite, April 23, 1988), p. 6-B.
186. ASETA, ASETA Informativo (vol. 1, no. 2, June 1987), p. 2.
187. Andean Telecommunications Satellite Organization
188. ASETA, "Proyecto del Acuerdo Relativo a la Organizacion Subregional Andina de Telecomunicaciones por Satelite: CONDORSAT," (ASETA-131, Quito, Ecuador, Febrero, 1985), pp. 1-92.
189. ASETA Informativo, "Reunion de Presidentes de las Empresas Estatales de Telecomunicaciones del Acuerdo Subregional Andino," (Meeting of Presidents of the State Telecommunication Enterprises of the Andean Subregional Agreement, vol. 2, no. 1, March 1988) p. 1.
190. "Colombia y Venezuela: Direccion y Sede del CONDOR," El Tiempo, p. 3.
191. Andean Telecommunications Satellite Commission.
192. ASETA, "Acta de la XII Reunion de la Junta Directiva de la Asociacion de Empresas Estatales de Telecomunicaciones del Acuerdo Subregional Andino," (Minute of the XII Meeting of ASETA's Board of Director, Quito, Ecuador, 1981), p. 14; and, Leonardo Ferreira, "The Geostationary Orbit and the Equatorial Countries' Claim of Sovereignty: Historical Overview and Update," (Paper presented at the XXX Conference of the International Communication Association, New Orleans,

May 25-29, 1988), p. 62.

193. World Administrative Radio Conferences on the use of the geostationary satellite orbit and the planning of space services utilizing it.

194. CATSAT, "Principales Conclusiones del la II Reunion del Comit  Tecnico Asesor de la Comision Andina de Telecomunicaciones por Satelite," pp. 6-7.

195. "El CONDOR Pasa," Semana (no. 254, March 17-23, 1987), pp. 36-37.

196. Ferreira and Mody, p. 7; and TELECOM, "Sistema Andino de Telecomunicaciones por Satelite," p. 5.

197. ASETA, "Acta Final de la XIII Reunion de la Junta Directiva de la Asociacion de Empresas Estatales de Telecomunicaciones del Acuerdo Subregional Andino," p. 9. (Translated by the author).

198. Angel Velasquez, "Estudios de Factibilidad sobre un Sistema Regional de Satellites para los Paises Andinos," p. 2.

199. Ibidem, p. 3.

200. Carlos Castro-Cornejo (General Manager IETEL-Ecuador), "The Role of the Andean Satellite Communication System Or: Will the "CONDOR" Fly High in the Andean Skies?" p. 2.

201. "No Hay Alternativa al Satelite CONDOR," El Tiempo, p. 6-B.

202. ASETA, "Acta de la XV Reunion de la Junta Directiva de la Asociacion de Empresas Estatales de Telecomunicaciones del Acuerdo Subregional Andino," (Minute of the XV Meeting of the ASETA's Board of Directors, Santa Cruz de la Sierra, Bolivia, November/December 1983) p. 9.

203. ASETA, "Acta de la XIV Reunion de la Junta Directiva de la Asociacion de Empresas Estatales de Telecomunicaciones del Acuerdo Subregional Andino," p. 7.

204. Larry Martinez, Communications Satellites: Power Politics in Space (Dedham, MA: Artech House, Inc., 1985), pp. 10-12.

205. Ferreira and Mody, p. 3.

206. Resolution 3 (former Resolution BP) Relating to the Use of the Geostationary-Satellite Orbit and to the Planning of Space Services Utilizing It." Reprinted in Nicolas Mateesco

Matte, Aerospace Law: Telecommunications Satellites, (Toronto, Butterworth & Co., 1982), Appendix.

207. Jaime Aguilera, "Las Telecomunicaciones en el Pacto Andino," p. 13-14.

208. See, Angel Velasquez, "Satellites de Comunicacion en Latinoamerica," Ciencia y Tecnica (Communication Satellites in Latin America, Bogota, Colombia: Colciencias, 1982), p. 8; Angel Velasquez, "Estudios de Factibilidad sobre un Sistema Regional de Satellites, p. 12; Hernan Latorre, "La Integracion Fisica en el Contexto del Pacto Andino," Nueva Sociedad (Physical Integration in the Context of the Andean Pact, vol 13, no. 3, San Jose, Costa Rica, July/October, 1978), p. 49.

209. Oscar Jaramillo, "La Tentacion de los Satellites," El Pais (The Temptation of Satellites, Cali, Colombia, May 12, 1985), p. B-1.

210. See, "Satellites for Development, Broadcasting and Information," Communication Research Trends (vol. 4, no. 2, 1983), p. 2.

211. Willy Moenandir, "Indonesian Telecommunications Development," Telematics and Informatics (vol. 2, no. 1, 1985), p. 84.

212. ESCO, "Configuration Comparison," p. 4.

213. TELECOM, "Sistema Andino de Telecomunicaciones por Satellite: Proyecto CONDOR," p. 9; and ESCO, "Configuration Comparison," p. 15.

214. Ibidem.

215. Ibidem.

216. ASETA, "Acta de la XVIII Reunion de la Junta Directiva de la Association de Empresas Estatales de Telecomunicaciones del Acuerdo Subregional Andino," Minute of the XVIII Meeting of ASETA's Board of Directors, Cusco, Peru, June 1985), p. 6; TELECOM, "Sistema Andino de Telecomunicaciones por Satellite," annex no. 14.

217. ESCO, "Configuration Comparison," pp. 2-4.

218. See, Raul Rodriguez, "Pan American Satellite Corporation: New Opportunities for Latin American Telecommunications Development," New Directions in Satellite Communications (edited by Heather E. Hudson, Dedham, MA: Artech House, Inc., 1985), p. 72.

219. Joao Carlos Fagundes, "Brazilian Satellite Communications Program," New Directions in Satellite Communications, pp. 222-223.

220. Heather E. Hudson, When Telephones Reach the Village (Norwood, New Jersey: Ablex Publishing Corporation, 1984), p. 123.

221. Jaime Nino, "Satelite y Soberania," in Las Cinco Maravillas, p. 185.

222. See, for instance, ASETA, "Presentacion de Proyectos de Integracion en Telecomunicaciones del Area Subregional Andina a la Comunidad Economica Europea," p. 27.

223. ESCO, "Technical Comparison," p. 15.

224. Ibidem, figure 3--INTELSAT.

225. Joseph Pelton, "INTELSAT: The Geosynchronous Orbital Arc and the Third World," (Pacific Telecommunications Conference Proceeding, Honolulu, Hawaii, 1983), p. 140.

226. Norman P. Fenton, "Satellite Technology--A Vehicle for Health Training," Development Communication Report (no. 54, Summer 1986), p. 16.

227. Joseph Pelton, "INTELSAT: Global Telecommunications for the 21st Century," Intermedia (vol. 4, no. 4/5, July/September 1986).

228. ESCO, "Configuration Comparison," pp. 11, 15.

229. Roger W. Fontaine, The Andean Pact: A political Analysis (The Washington Papers, Beverly Hills: Sage Publications, Inc., 1977), p. 26.

230. JUNAC, "Acta Final de la Cuarta Reunion del Grupo Cuatripartito CAF/JUNAC/BID/BIRF de Integracion Fisica," (Final Minute of the Four-Party Group ADC/JUNAC/IBD/IBRD of Physical Integration, July 20, 1984).

231. ASETA, II Reunion del Comité Técnico Asesor de la Comisión Andina de Telecomunicaciones por Satélite (II meeting of the Technical Advisory Committee, Quito, October

4, 1985), p. 6.

232. Heather E. Hudson, When Telephones Reach the Village, pp. 122-123.

233. Elker Buitrago, Manual del Derecho de las Comunicaciones en Colombia (Handbook of Communications Law in Colombia, Bogota, Editorial Colombiana, Ltda., 1980, p. 616. Translated by the author.

234. The Bogota Declaration in Nicolas M. Matte, Aerospace Law: Telecommunications Satellites (Toronto: Butterworth & Co., 1982, Appendix XV), p. 341.

235. Ibidem.

236. In Matte, p. 343.

237. Marietta Benko, Willem De Graff and Gijsbertha C. M. Reijnen, Space Law in the United Nations, Dordrecht, the Netherlands: Martinus Nijhoff Publishers, 1985), p. 139.

238. Ibidem, p. 131.

239. "Colombia Protesta Ante Estados Unidos," (Colombia Protests to the United States, El Siglo, April 11, 1985) p. 2. See, Leonardo Ferreira, "The Geostationary Orbit and the Equatorial Countries' Claim of Sovereignty: Historical Overview and Update," p. 62-65.

240. Angel Velasquez, Ciencia y Tecnica, p. 8.

241. Mattelart and Schmucler, America Latina en la Encrucijada Telematica, pp. 70-71.

242. Raquel Salinas, "Technology Choice and the Andean Countries," (manuscript paper, n.d.).

243. Jaime Aguilera, "Las Telecomunicaciones en el Pacto Andino," p. 22.

APPENDIX

MAP OF THE ANDEAN PACT AREA

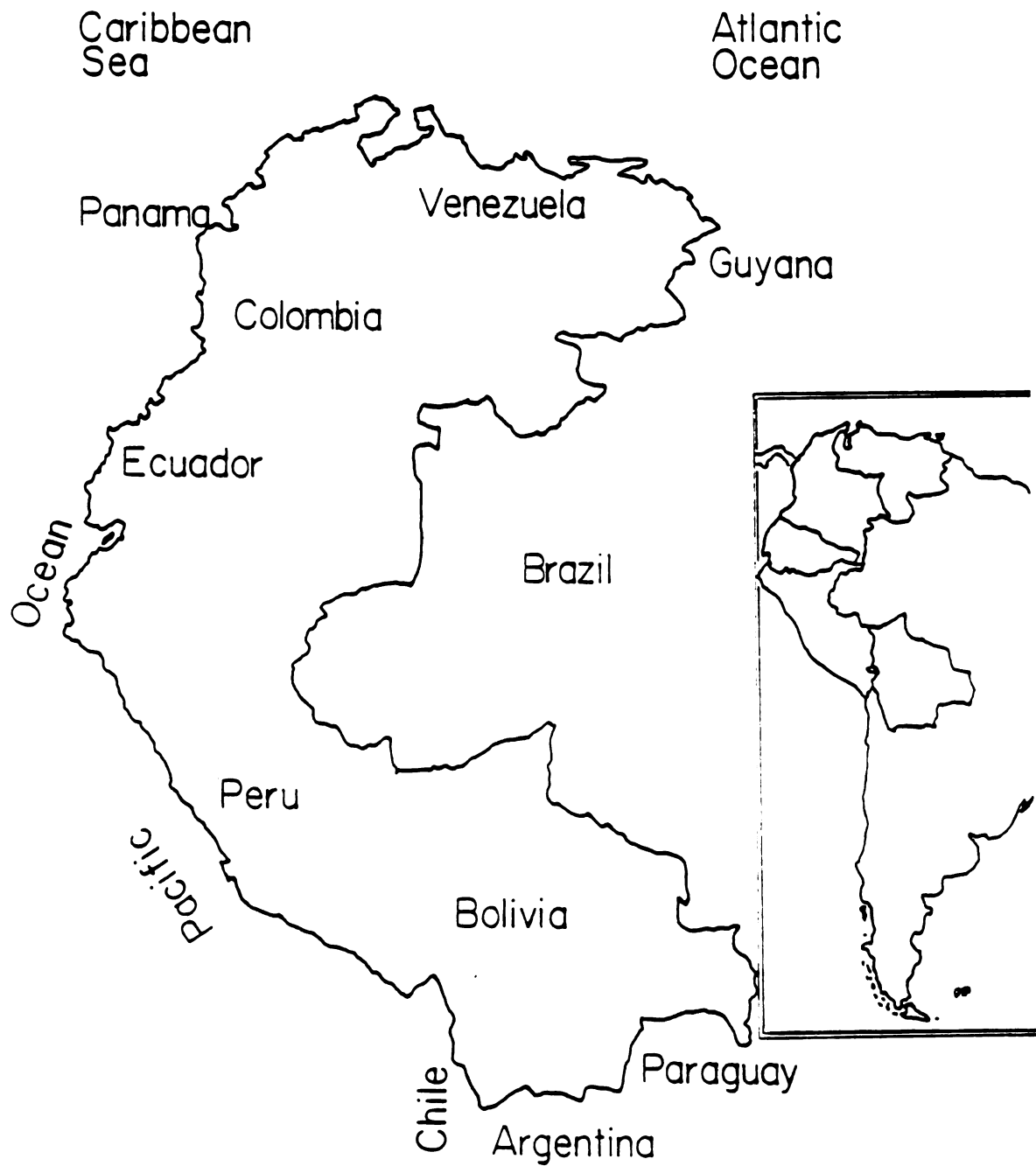
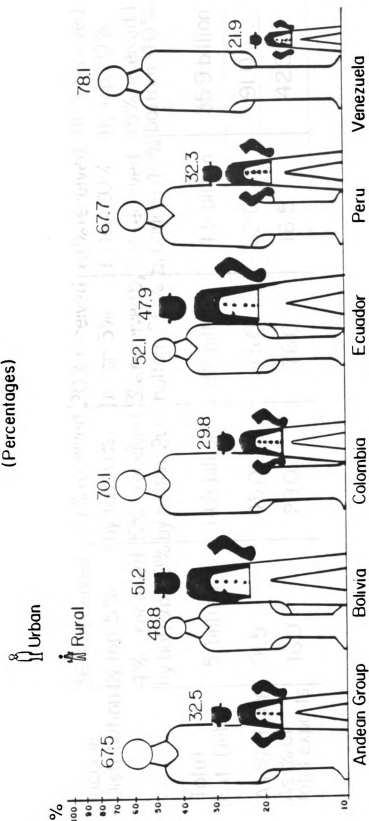


FIGURE 1.

FIGURE 2.

ANDEAN GROUP: STRUCTURE OF THE
URBAN AND RURAL POPULATION
IN 1986
(Percentages)



Source: JUNAC J/UI ES/038 November 9, 1986
(organized by author)

ANDEAN PACT COUNTRIES : SOCIO-ECONOMIC INDICATORS

	<u>Bolivia</u>	<u>Colombia</u>	<u>Ecuador</u>	<u>Peru</u>	<u>Venezuela</u>
PQLI Index	53	77	73	69	83
GNP/Capita	U.S. 470	U.S. 1320	U.S. 1160	U.S. 1010	U.S. 3080
Income Distribution	36% received by top 5% 4% received by bottom 20%	40% received by top 10% 5% received by bottom 20%	20% received by top 3% 3% received by bottom 20%	61% received by top 20% 7% received by bottom 40%	48% received by top 20% 15% received by bottom 40%
Total Ext. Debt :	5 billion	14.8 billion	8.2 billion	14.5 billion	35.9 billion
As % of GNP	91.5	45.0	75.0	62.0	91.0
As % of total exports	16.0	29.0	76.0	16.5	42.0

Source: JUNAC J/UI.ES/O38 & Encyclopedia of the Third World
TABLE I.

TELECOMMUNICATION MEDIA RATES IN
THE ANDEAN PACT AREA

(Per 100)

	Telephones	Radio Sets	TV Sets	PCs
BOLIVIA	2.6	57.5	6.5	.47
COLOMBIA	8.2	13.3	9.8	.84
ECUADOR	3.4	31.9	6.1	.59
PERU	2.7	16.6	5.1	.61
VENEZUELA	9.2	41.5	12.8	3.18
ANDEAN P.	5.2	32.2	8.1	1.14

Source: Forero (1987) & Fobes (1986)

TABLE 2.

STATUS EARTH STATIONS IN PERU

<u>NAME</u>	<u>TYPE</u>	<u>STANDARD</u>	<u>OPERATIONAL</u>
Andoas	D	N/A	Planned
Atalaya	D	N/A	Planned
Barranca	D	N/A	Planned
Caballococha	D	N/A	Yes
Cabo Pantoja	D	N/A	Planned
Chachapoyas	D	N/A	Yes
Chavez Valdivia	D	N/A	Planned
Constitution	D	N/A	Planned
Contama	D	N/A	Yes
Iñapari	D	N/A	Planned
Intuto	D	N/A	Planned
Iquitos	D	B	Yes
Jeberos	D	N/A	Planned
Juanjui	D	Z	Yes
Lurin- 1	I	A	Yes
Lurin- 2	D	B	Yes
Mavta	D	N/A	Planned
Miguel Colina	I	A	Yes
Pebas	D	N/A	Planned
Pucallpa	D	B	Yes
Puerto Bermudez	D	N/A	Planned
Puerto Esperanza	D	N/A	Planned
Puerto Inca	D	N/A	Planned
Puerto Maldonado	D	N/A	Planned
Quillabamba	D	N/A	Planned
Requena	D	N/A	Planned
Sandia	D	N/A	Planned
Santa Clotilde	D	N/A	Planned
Santa Maria de Nieva	D	N/A	Planned
Saposa	D	Z	Yes
Tamanco	D	N/A	Planned
Tarapoto	D	B	Yes
Tocache	D	Z	Yes

D= Domestic

I= International

As of December 1987

TABLE 3.

STATUS EARTH STATIONS IN COLOMBIA

<u>NAME</u>	<u>TYPE</u>	<u>STANDARD</u>	<u>OPERATIONAL</u>
Acandi	D	Z	Yes
Arauca	D	Z	Yes
Bahia Solano	D	Z	Yes
Barranquilla	D	Z	Yes
Cerrejon	D	Z	Yes
Choconta-1	I	A	Yes
Choconta-2	D	Z	Yes
Choconta-3	I	A	Yes
Choconta-4	I	B	Yes
Leticia	D	Z	Yes
Mitu	D	Z	Yes
Puerto Asis	D	Z	Planned
Puerto Carreño	D	Z	Yes
Puerto Inirida	D	Z	Yes
Puerto Leguizamo	D	Z	Yes
Quibdo	D	Z	Planned
San Andres-1	D	Z	Yes
San Andres-2	D	Z	Yes
San Jose del Guaviare	D	Z	Planned
San Vicente del Caguan	D	Z	Yes
Tumaco	D	Z	Planned
Vichada	D	Z	Planned

D= Domestic

I= International

As of December 1987

TABLE 4.

STATUS EARTH STATIONS IN VENEZUELA

<u>NAME</u>	<u>TYPE</u>	<u>STANDARD</u>	<u>OPERATIONAL</u>
Camatagua- 1	I	A	Yes
Camatagua- 2	I	A	Yes
Camatagua- 3	D	Z	Yes
Camatagua- 4	I	B	Yes
Camatagua- 5	I	A	Planned
Ciudad Piar	D	N/A	Planned
El Dorado	D	N/A	Planned
Elorza	D	N/A	Planned
Laguinillas	D	N/A	Planned
Luepa	I	D	Yes
Puerto Ayacucho	D	Z - TVRO	Yes
Puerto Paez	D	N/A	Planned
Puerto Ordaz	D	N/A	Planned
Quemiquea	D	N/A	Planned
San Carlos del Rio Negro	D	N/A	Planned
San Carlos del Zulia	D	N/A	Planned
San Fernando de Apure	D	Z - TVRO	Yes
Santa Helena de Vairen	I	D	Yes
San Telmo	D	Z	Yes
San Tome	D	N/A	Planned
Tucupita	D	N/A	Planned
Tumeremo	D	N/A	Planned

D= Domestic

I = International

As of December 1987

TABLE 5.

STATUS EARTH STATIONS IN BOLIVIA AND ECUADOR

BOLIVIA

<u>NAME</u>	<u>TYPE</u>	<u>STANDARD</u>	<u>OPERATIONAL</u>
Cobija	D	N/A	Planned
Magdalena	D	N/A	Planned
Puerto Suarez	D	N/A	Planned
Reyes	D	N/A	Planned
Riberalta	D	N/A	Planned
Robore	D	N/A	Planned
Santa Ana	D	N/A	Planned
Santa Cruz	D	N/A	Planned
San Jose de Chiquitos	D	N/A	Planned
Tiahuanaco	I	A	Yes

ECUADOR

Galapagos	D	B	Planned
Guayaquil	I	A	Planned
Quito	I	A	Yes

D= Domestic

I = International

As of December 1987

Source: ASETA/ITU & INTELSAT Annual Reports

TABLE 6.

BIBLIOGRAPHY

BIBLIOGRAPHY

- Agency for International Development (AID). AID Rural Satellite Program, Washington D.C.: AID/Academy for Educational Development Inc., June 1981.
- Aguilera B, Jaime. "Las Telecomunicaciones en el Pacto Andino," Integracion y Comunicacion (Symposium), Bogota, Colombia, November 25-29, 1985.
- Angarita, Ciro and Coffey, Peter (eds.). Europe and the Andean Countries, London: Pinter Publishers, Ltd., 1988.
- Asociacion de Empresas Estatales de Telecomunicaciones del Acuerdo Subregional Andino (ASETA). Principales Conclusiones de la II Reunion del Comité Técnico Asesor de la Comisión Andina de Telecomunicaciones por Satélite, Quito, Ecuador: October 2-4, 1985.
- _____. Presentacion de Proyectos de Integracion en Telecomunicaciones del Area Subregional Andina a la Comunidad Economica Europea, Doc. ASETA-111, Quito, Ecuador, April 1984.
- _____. Acta de la XV Reunion de la Junta Directiva de la Asociación de Empresas Estatales de Telecomunicaciones del Acuerdo Subregional Andino, Santa Cruz de la Sierra, Bolivia, November/December 1983.
- _____. Informe del Secretario General a la XVI Reunion de la Junta Directiva de la Asociación de Empresas Estatales de Telecomunicaciones del Acuerdo Subregional Andino, Bogota, Colombia, September 1984.
- _____. Proyecto del Acuerdo Relativo a la Organización Subregional Andina de Telecomunicaciones por Satélite: "CONDORSAT", Doc. ASETA-131, Quito, Ecuador, February 1985.
- _____. Estudio de Factibilidad de un Sistema de Telecomunicaciones por Satélite para los Países de la Subregion Andina. Doc. ASETA-047, Quito, Ecuador, October 1977.
- _____. Acta de la XII Reunion de la Junta Directiva de la Asociación de Empresas Estatales de Telecomunicaciones del Acuerdo Subregional Andino, Quito, Ecuador, 1981.
- _____. Informe sobre los Avances del Proyecto Sistema Andino de Telecomunicaciones por Satélite, Theme no. 2, XVII Board of Directors, Cusco, Peru, June 1985.
- _____. Acta de la XVI Reunion de la Junta Directiva de la Asociación de Empresas Estatales de Telecomunicaciones del Acuerdo Subregional Andino, Bogota, Colombia, September 1984.
- _____. Informe del Secretario General a la XIII Reunion de la Junta Directiva de la Asociación de Empresas Estatales de Telecomunicaciones del Acuerdo Subregional Andino, Lima, Peru, January 1982.

- . Acta de la XIV Reunion de la Junta Directiva de la Asociacion de Empresas Estatales de Telecomunicaciones del Acuerdo Subregional Andino, Panama, Panama, February 1983.
- . Sistema Regional Andino de Comunicaciones por Satelite con Capacidad INTELSAT Compartida: Aspectos Tecnico-Economicos, Documento ASETA-105, Quito, Ecuador, October 1983.
- . Field Trial Program for Testing the Operation of Three Television Carriers in a 72 MHz Transponder, Doc. ASETA-141, May 1985, rev. 1, Quito, Ecuador, June, 1985.
- . Acta de la XVII Reunion de la Junta Directiva de la Asociacion de Empresas Estatales de Telecomunicaciones del Acuerdo Subregional Andino, Quito, Ecuador, April 1985.
- ASETA Informativo. "Reunion de Presidentes de las Empresas Estatales de Telecomunicaciones del Acuerdo Subregional Andino," vol. 2, no. 1, Quito, Ecuador, March 1988.
- . "Sistema Andino de Telecomunicaciones por Satelite (Proyecto CONDOR)," vol. 1, no. 2, June 1987.
- Ballochi, Roberto. "Algunos Antecedentes sobre el Satelite Educativo para America del Sur," Comunicacion y Cultura, no. 3, 1986.
- Beltran S, Luis R., and Fox de Cardona, Elizabeth. "Latin America and the United States: Flaws in the Free Flow of Information," in National Sovereignty and International Communication, edited by Kaarle Nordenstreng and Herbert I. Schiller, Norwood, NJ: Ablex Publishing, Corp., 1979.
- . Comunicacion Dominada, Mexico, D.F.: Editorial Nueva Imagen, 1980.
- Benko, Marietta; De Graff, Wilem; and Reijnen, Gijsbertha C. M. Space Law in the United Nations, Dordrecht, The Netherlands: Martinus Nijhoff Publishers, 1985.
- Block, Clifford; Goldschmidt, Douglas; Hafid, Anwar; and Velasquez, Angel. "Satellite Telecommunications for Development: The AID Rural Satellite Program and its Pilot Projects in Indonesia, Peru and the Caribbean," Pacific Telecommunications Council Proceedings, Honolulu, Hawaii: PTC, 1984.
- Bonilla, Jose. Peru Pre-Hispanico, Lima, Peru: Ediciones Kuntur, 1983.
- Borrego, Jorge and Mody, Bella. "Contextual Analysis of Adoption of a Communications Technology," Telecommunications Policy, in press, 1988.
- Broadcasting. "INTELSAT parts from U.S. on Pricing," December 28, 1987.
- . "Cloak and Dagger over PANAMSAT Negotiations," March 31, 1986.
- . "Where Things Stand--International Satellite," July 4, 1988.
- Buitrago, Elker. "Estado, Legislacion y Comunicaciones,"

- Gaceta, Bogota, Colombia, July/August, 1987.
- Manual del Derecho de las Comunicaciones en Colombia, Bogota, Colombia: Editorial Colombiana, Ltd., 1980.
- Butler, Richard E. "Some Thoughts on the Results of the 1985 Orbit Conference," Telecommunication Journal, vol. 53, no. 2, 1986.
- Castro C., Carlos. "The Role of the Andean Satellite Communication System Or: Will the "CONDOR" Fly High in the Andean Skies," Pacific Telecommunications Council Proceedings, Honolulu, Hawaii, 1979.
- Chander, Romesh and Karnik Kiran. "Planeamiento de Radiodifusion por Satelite: El Experimento de Television Educativa en la India," Estudios y Documentos de Comunicacion Social, no. 78, Paris, UNESCO, 1976.
- Chu, Godwin C. "Indonesian Satellites ... TV Promotes National Goals." Centerviews, January/February, 1984.
- Clayton, Lawrence A. The Bolivarian Nations of Latin America, Arlington Heights, IL: the Forum Press, 1984.
- Cleevely, David. "Regional Structure and Telecommunications Planning," Telecommunications Policy, June 1984.
- Clifford, Reginald A. "The Morelos II Satellite System: Developmental Necessity or Political Expediency," Pacific Telecommunications Council Proceedings, Honolulu, Hawaii, 1986.
- Communication Research Trends. "Satellites for Development, Broadcasting and Information," vol. 4, no. 2, 1983.
- Comunicacion. "Satelite Andino," no. 46, Caracas, Venezuela, June 1984.
- Comunicacion y Cultura. "Diseno y Metodologia del Estudio de la Viabilidad de un Sistema Regional de Teleduccion para los Paises de America del Sur," no. 3, 2nd edition, Mexico D.F., 1986.
- Corporacion Andina de Fomento. "Programa de Integracion Fisica y Telecomunicaciones para el Grupo Andino," Carta de la CAF, no. 53, July/August 1982.
- Demac, Donna A; Coddling Jr., George A; Hudson, Heather; and Jakhu, Ram S.. Access to Orbit: After the 1985 ITU Space WARC, London: International Institute of Communications, June 1986.
- Departamento Administrativo Nacional de Estadistica (DANE). Colombia Estadistica 86, Bogota, Colombia: DANE, 1987.
- Dissanayake, Wimal. "Communications Technology and National Development: A Third World Perspective," Pacific Telecommunications Council Proceedings, Honolulu, Hawaii: PTC, 1981.
- Dizard Wilson. "The Role of International Satellite Networks," in Tracing New Orbits, edited by Donna A. Demac, New York: Columbia University Press, 1986.
- Ediciones Colatina. "Acuerdo de Cartagena," in Pacto Andino: Textos Fundamentales, Bogota, Colombia, Ediciones Colatina, 1979.

- El Colombiano. "Francia Ofrece Amplia Cooperacion," Medellin, Colombia, October 8, 1984.
- El Espectador. "Colombia Descarta Satelite Recuperado por el Discovery," February 24, 1985.
- El Siglo. "Colombia Protesta ante Estados Unidos," April 11, 1985.
- El Tiempo. "No hay Alternativa al Satelite CONDOR," Bogota, Colombia, April 23, 1988.
- _____. "Colombia y Venezuela: Direccion y Sede del CONDOR," March 29, 1988.
- _____. "Tranquilandia, la Mayor Derrota del Cartel," December 9, 1987.
- _____. "Comision Andina Notifico Sistema Satelital CONDOR," March 31, 1985.
- Empresa Nacional de Telecomunicaciones (TELECOM). Sistema Andino de Telecomunicaciones por Satelite: Proyecto CONDOR, Bogota, Colombia, Oficina Asesora para Asuntos Internacionales, Noviembre 1986.
- _____. La Orbita Geoestacionaria y las Telecomunicaciones por Satelite en la Prensa Colombiana, Bogota, Colombia, Oficina Asesora para Asuntos Internacionales, 1986.
- _____. Acta de la Reunion de la Comision Encargada de Coordinar y Formular la Notificacion a la IFRB de las Posiciones Orbitales y Frecuencias del Sistema Satelite Andino "CONDOR," Ginebra, March 4-8, 1985.
- _____. Proyecto SATCOL: Desarrollo Cronologico del Proyecto SATCOL y las Actividades Concernientes a la Posicion de Colombia sobre la Orbita Geoestacionaria, OAI-78, rev. 1, Bogota, Colombia, Oficina Asesora para Asuntos Internacionales, 1979.
- Euromonitor Publications. South American Economic Handbook, London: Euromonitor Publications Ltd., 1986.
- European Consulting Satellite Organization (ESCO). Excerpts on a feasibility study of a regional satellite for the Andean Pact countries--Project CONDOR, 1986.
- Excelsior. "El Pacto Andino Salvo su Crisis Politica, Dice Gutierrez Zalles," Mexico, D.F., March 1, 1988.
- _____. "Continuaran Decreciendo Paises del Pacto Andino," March 12, 1988.
- _____. "Lanzaran Satelites de Comunicaciones Cinco Paises Andinos," September 7, 1987.
- _____. "Guerra del Grupo Andino a Narcos," March 22, 1988.
- Eward, Ronald S. The Competition for Markets in International Telecommunications, Dedham, MA: Artech House, Inc., 1984.
- Fadul G., Ligia Maria. "Las Comunicaciones Via-Satelite en America Latina," Cuadernos del Ticom, no. 31, Mexico, February, 1984.

- Fagundes A., Joao C. "Brazilian Satellite Communications Program," in New Directions in Satellite Communications, edited by Heather Hudson, Dedham, MA: Artech House Inc., 1985.
- Fenton, Norman P. "Satellite Technology: A Vehicle for Health Training," Development Communication Report, No. 54, Summer 1986.
- Ferreira, Leonardo. "The Geostationary Orbit and the Equatorial Countries' Claim of Sovereignty: Historical Overview and Update," International Communication Association, New Orleans, May 25-29, 1988.
- Ferreira, Leonardo and Mody, Bella. "Análisis del Contexto sobre la Decisión de Adoptar un Sistema de Satélites Regional: El Caso del CONDOR Andino," Chasqui, in press, 1989. Ferreira, Leonardo and Straubhaar, Joseph. "Radio and the New Colombia," Journal of Popular Culture, vol. 22, no. 1, Summer 1988.
- Financial Times. "Agreement Reached on How to Allocate Space for Communications Satellites," London, December 10, 1988.
- Fobes, Jeff. "An Overview of Informatics and Development," Telematics and Informatics, vol. 4, no. 3, 1987.
- Fontaine, Roger W. The Andean Pact: A Political Analysis, Beverly Hills: Sage Publications, Inc., 1977.
- Foreign Broadcast International Service (FBIS). FBIS Index, (newspaper and broadcast News Index--accounts on Inter-American, Andean and other South American countries' satellite policy affairs), Washington D.C./USIA, 1983-1987.
- Forero, Clemente. Informatica e Integracion Economica, Bogota, Colombia: Tercer Mundo Editores, November 1987.
- Godden, Paul. "Satellites Seeking Space at WARC." Communications Systems Worldwide, London, October 1988.
- Goldschmidt, Douglas. "Financing Telecommunications for Rural Development," Telecommunications Policy, September 1984.
- _____. "The Entry of New Satellite Carriers in International Telecommunications: Some Interests of Developing Nations," in Tracing New Orbits, edited by Donna A. Demac, New York: Columbia University Press, 1986.
- Gomez L., Edmundo. Memoria del Ministro de Comunicaciones al Congreso de 1987, Bogota, Colombia: Ministerio de Comunicaciones, 1987.
- Grupo de Redactores Economicos de Bogota. "Crisis de la Informacion o Crisis de la Integracion," Integracion y Comunicacion (Symposium), Bogota, Colombia, November 25-29, 1985.
- Hardman, M. J (ed.). The Aymara Language and its Social and Cultural Context, Gainesville, FL: University Presses of Florida, 1981.
- Harper, Ian. "Networking the Middle East," South, September, 1984.
- Horizon House-Microwave. "ASETA (Andean Nations)/SATCOL

- (Colombia)," Worldwide Communications Satellite: 1978-1988, 1978.
- Hudson, Heather. "Demonstrating a Commitment to the Developing World," Telecommunications Policy, March 1987.
- _____. "Access to Information Resources: the Developmental Context of the Space WARC," in Tracing New Orbits, edited by Donna A. Demac, New York: Columbia University, 1986.
- _____. When Telephones Reach the Village, Norwood, NJ: Ablex Publishing Corporation, 1984.
- Integracion Latinoamericana. "The Andean Group: Fifteen Years Later," vol. 10, no. 98, January/February 1985.
- Intermedia. "ARABSAT, Elusive Unity," vol. 14, no. 2, March 1986.
- _____. "Satellites: An Intermedia Survey," vol. 4, no. 4/5, September 1986.
- International Bank for Reconstruction and Development/The World Bank. World Development Report 1987, New York: Oxford University Press, 1987.
- International Frequency Registration Board (IFRB). Information on Comments Received from other Administrations and on the Progress Made in any Difficulties Following the Advance Publication of Information on Planned Satellite Networks, Circular no. 1717, April 8, 1986.
- International Institute of Communications (ICC). ORB-88, A Pre-Conference Bulletin, London: ICC, August 1987.
- International Telecommunication Union. 15th/19th/20th/21st/23rd/24th Report by the International Telecommunication Union on Telecommunication and the Peaceful Uses of Outer Space, Booklet nos. 23/27/29/30/32/33, Geneva: ITU, 1976-1985.
- International Telecommunications Satellite Organization (INTELSAT) Annual Report of the Earth Station Implementation Schedule, Washington D.C., December 31, 1987.
- Jaramillo, Oscar. "La Tentacion de los Satelites," El Pais, Cali, Colombia, May 12, 1985.
- Jequier, Nicolas. "Telecommunications for Development: Findings of the ITU-OECD Project," Telecommunications Policy, June 1984.
- Junta del Acuerdo de Cartagena (JUNAC). Acta Final de la IV Reunion del Grupo Cuatripartito CAF/JUNAC/BID/BIRF de Integracion Fisica para los Paises del Grupo Andino, JUN.CAF/R.SCI/IV/Acta Final, Lima, Peru, July 20, 1984.
- _____. Informe de la I Reunion de la Comision Andina de Radio y Television, Quito, Ecuador, JUN/di 904, May 1-5, 1985.
- _____. II Reunion de Ministros de Transportes y Obras Publicas de los Paises Miembros del Acuerdo de Cartagena, Caracas, Venezuela, July 13-15, 1983.
- _____. Bases de una Estrategia Andina de Desarrollo en

- el Area de la Integracion Fisica, Lima, Peru, n.d.
- . El Proceso de Integracion en America Latina en 1983: El Grupo Andino, JUN/di 837, September 24, 1984.
- . El Grupo Andino: Evolucion y Perspectivas, JUN/di 899, April 26, 1985.
- . Compendio Estadistico del Grupo Andino (1980-1986), J/UI.ES/038, November 9, 1987.
- . Plan de Reorientacion del Proceso Andino de Integracion, COM/XXXV-E/dt 3, Rev. 2, July 9, 1983.
- . Indicadores Socio-Economicos (1970-1979), Lima, Peru: Sistema Subregional de Informacion Estadistica, 1981.
- . Para Nosotros la Patria es America, JUN/di 837, September 24, 1984.
- . Acta Final de la VI Reunion del Consejo de Integracion Fisica, C.IF/VI/Acta Final, Caracas, Venezuela, July 13, 1983.
- . Acta Final de la III Reunion de Ministros de Transportes, Comunicaciones y Obras Publicas, Cartagena, Colombia, September 1984.
- Junta International de Frecuencias (JIF). Publicacion Anticipada de Informacion Relativa a una Red de Satelite en Proyecto, AR11/A/208, July 9, 1985.
- Jussawalla, Meheroo. "The Geostationary Orbit: Economic Issues for the Pacific Region," Intermedia, vol 15, no. 1, January 1987.
- Kurian, George T. Encyclopedia of the Third World, vols. 1-3, Oxford: Facts on File Inc., 1987.
- Latorre, Hernan. "La Integracion Fisica en el Contexto del Pacto Andino," Nueva Sociedad, vol. 19/20, July/October 1975.
- Leal, Alvaro. "Satelite Condor," El Colombiano, Medellin, Colombia, June 26, 1988.
- Long, Mark. "Satellite Services Around the World," Satellite Orbit, September 1983.
- Lowndes, Jay C. "Peru, Colombia Seek Satellite Links to North America Via PANAMSAT," Aviation Week and Space Technology, April 14, 1986.
- Maherzi, Lofti. "A Highway into Space," Intermedia, vol. 14, no. 6, November 1986.
- Martinez, Larry. Communications Satellites: Power Politics in Space, Dedham, MA: Aterch House, Inc., 1985.
- Mateesco-Matte, Nicolas. Aerospace Law: Telecommunications Satellites, Toronto: Butterworth & Co., 1982.
- Mattelart, Armand and Schmucler, Hector. America Latina en la Encrucijada Telematica, Buenos, Aires, Argentina: Editorial Paidos/SACIF, 1983.
- . Agresion Desde el Espacio, Bogota, Colombia: Editorial Siglo XXI, 1985.
- Mayo, John K; Heald, Gary R; Klees, Steven J; and Velaquez A, Angel. "Rural Satellite Communications in Peru,"

- Intermedia, Vol 15, no. 3, May 1987.
- Miglierini, Daniela U and Luna, Orlando. "La Informatica en Venezuela ," Comunicacion, no. 46, Caracas, Venezuela, June 1984.
- Ministerio de Comunicaciones. Red Publica Nacional de Transmision de Datos de Colombia-COLDAPAQ, Bogota, Colombia, Oficina de Prensa, n.d.
- Ministerio de Informacion y Turismo. La Cooperacion Internacional de Venezuela, Caracas, Venezuela: Imprenta Nacional, 1982.
- Moenandir, Willy. "Indonesian Telecommunications Development: An Overview," Telematics and Informatics, vol. 2, no. 1, 1985.
- Mody, Bella. "Lessons from the Indian Satellite Experiment," manuscript, n.d.
- _____. "Contextual Analysis of the Adoption of a Communications Technology: the Case of Satellites in India," Telematics and Informatics, vol. 4, no. 2, 1987.
- Moore, Steve. "Shooting for Satellites," On Communications, November 1985.
- Morawetz, David. "Problemas del Transporte y de las Comunicaciones en el Grupo Andino," Revista de la Integracion, vol. 6, November 1972.
- Nino, Jaime. "Satelite y Soberania," in Las Cinco Maravillas Millonarias de Colombia, Bogota, Colombia: Editorial Oveja Negra/FESCOL, 1982.
- NTC/NCT Newsletter. "Satellite Panorama in Latin America," vol. 1, no. 2, Lima, Peru, May 1986.
- _____. "Andean Information Network," vol. 1, no. 3, August 1986.
- _____. "The Mechanization of the Andean System of Technological Information," vol 1, no. 3, August 1986.
- _____. "Development of Informatics in Latin America," vol 1, no. 3, August 1986.
- _____. "An Overview of Cable Television in Latin America," vol. 1, no. 4, January 1987.
- Ospina, Sylvia. "The Geostationary Orbit: The Equatorial Countries' Claim to Sovereign Rights," mimeographed, 1983.
- _____. "Project CONDOR: An Analysis of the Feasibility of a Regional Satellite System for the Andean Pact Countries," Institute of Air and Space Law, McGill University, Montreal, February 1988.
- Pelton, Joseph N. "INTELSAT: The Geosynchronous Orbital Arc and the Third World," Pacific Telecommunications Council Proceedings, Honolulu, Hawaii: PTC, 1983.
- _____. "INTELSAT: Responding to New Challenges," in Tracing New Orbits, edited by Donna A. Demac, New York: Columbia University Press, 1986.
- _____. "INTELSAT: Global Telecommunications for the 21st Century," Intermedia vol. 4, no. 4/5, July/September 1986.
- Ploman, Edward. "A Guide to Satellite Communication," Reports

- and Papers on Mass Communication, no. 66, Paris: UNESCO, 1972.
- Powell, Jon T. International Broadcasting by Satellite, Westport, CT: Quorum Books, 1985.
- Rodriguez, Raul R. "Pan American Satellite Corporation: New Opportunities for Latin American Telecommunications Development" in New Directions in Satellite Communications, edited by Heather E. Hudson, Dedham, MA: Artech House, Inc., 1985.
- Salcedo-Bastardo, Jose Luis. Bolivar: a Continent and its Destiny, Richmond/Surrey, England: The Richmond Publishing Company, 1977.
- Salinas B., Raquel. "Information in the Third World: Adjusting Technologies or Strategies?" Media, Culture and Society, vol. 7, 1985.
- _____. "Technology Choice and the Andean Countries," mimeographed, n.d.
- Sanchez R., Miguel E. "Key Issues in Satellite Communication: The Mexican Satellite Program," in New Directions in Satellite Communications, edited by Heather Hudson, Dedham, MA: Artech House, Inc., 1985.
- Sanin P., Noemi. "Satelite Andino," in Memoria al Congreso: 1984-1985, Bogota, Colombia: Ministerio de Comunicaciones, 1985.
- _____. Una Revolucion de las Comunicaciones--Memoria al Congreso: 1982-1986, Bogota, Colombia: Ministerio de Comunicaciones, 1986.
- _____. "Reunion Mundial Preparatoria de la Conferencia sobre Planificacion de Servicios Especiales," in Telecomunicaciones para el Desarrollo, Bogota, Colombia: Ministerio de Comunicaciones, 1985.
- Santos C., Enrique. "Tecnologia, Imperialismo y Educacion," Comunicacion y Cultura, no. 3, Mexico, D.F., 1986.
- Saunders, Robert J. "Telecommunications in the Developing World," Telecommunications Policy, December 1983.
- Schneider, Jr., William. "Communications Satellite Systems," Department of State Bulletin, Washington D.C., September 1985.
- Schenkel, Peter. "America Latina y la "Compunicacion," Parts 1, 2, and 3, Chasqui, January/March, April/June, and July/September, 1984.
- Schmucler, Hector. "25 Anos de Satelites Artificiales," Comunicacion y Cultura, no. 9, Mexico D.F., 1983.
- Schramm, Wilbur. "Communication Satellites for Education, Science and Culture," Reports and Papers on Mass Communication, no. 53, UNESCO, 1968.
- Semana. "El Condor Pasa," Bogota, Colombia, March 17, 1987.
- _____. "Cuanto Gana la Gente," Bogota, Colombia, August 9, 1988.
- Servicio de Informacion y Documentacion de Bolivia (SIDBOL). Cronologia Economico-Politica, La Paz, Bolivia/Bogota, Colombia, June 1987.

- Soroos, Marvin S. "The Commons in the Sky: The Radio Spectrum and Geosynchronous orbit as issues in global policy," International Organization, Summer 1982.
- Smith, Delbert D. "The Andean Model," Satellite Communications, July 1978.
- South. "Classrooms in Orbit: Teaching Via Satellite Boosts the Quality of Indonesian Education," February 1986.
- _____. "Brazil: Exorbitant Communications," July 1987.
- Television/Radio Age, "PANAMSAT Readies Launch," November 1987.
- Torero, Alfredo. El Quechua y la Historia Social Andina, La Habana, Cuba: Editorial de Ciencias Sociales, 1980.
- Torres, Hector. "Colombia y el Satelite Educativo," Comunicacion y Cultura, no. 3, 1986.
- The Economist. "Latin America: Not Again Please," August 20, 1988.
- Ulloa, German. "Satelites: la Carrera Apenas Comienza," El Tiempo, Bogota, Colombia, March 28, 1988.
- United Nations. Draft Report of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space (Vienna, August 9-21), A/CONF.101/3, April 20, 1982.
- Velasquez A., Angel. "Estudios de Factibilidad sobre un Sistema Regional de Satelites," Instituto Geofisico del Peru, Doc. IGP-04/DICPE-78, February 1978.
- _____. "Satelites de Comunicacion en Latinoamerica," Ciencia y Tecnica, Bogota, Colombia, 1982.
- Virata, Nestor A. "Social and Policy Implications of Introducing New Services in a Developing Country," Pacific Telecommunications Council Proceedings, Honolulu, Hawaii: PTC, 1982.
- Vision. "Nuevo Impulso al Grupo Andino," vol. 68, no. 12, Mexico D.F., June 15/29, 1987.
- Yoda, Kenji and Ugai, Yuhei. "System Configurations and Applications in Domestic/Regional Satellite Communications," Pacific Telecommunications Council Proceedings, Honolulu, Hawaii: PTC, 1983.

MICHIGAN STATE UNIV. LIBRARIES



31293006926574