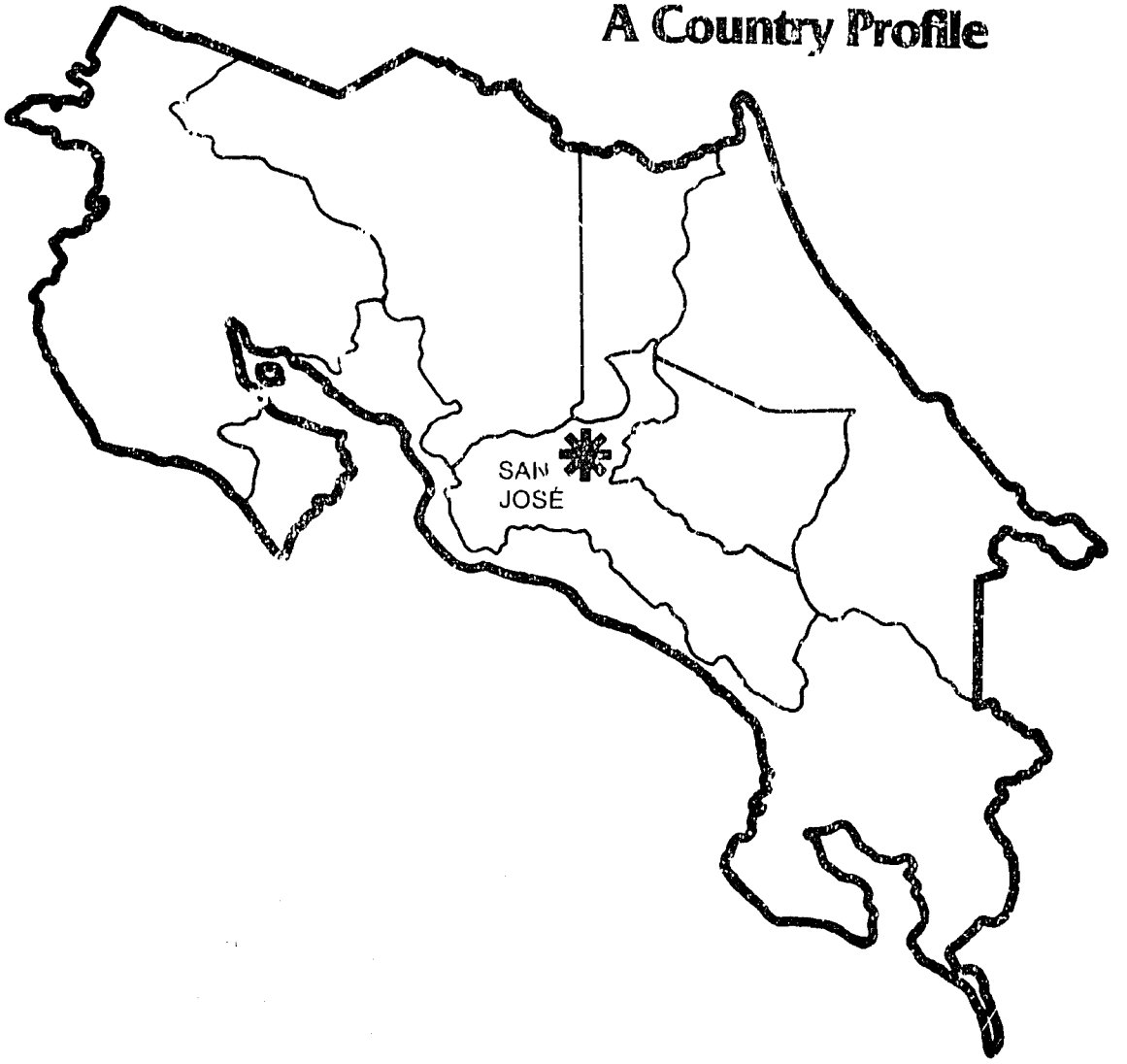
PN-AAZ-162

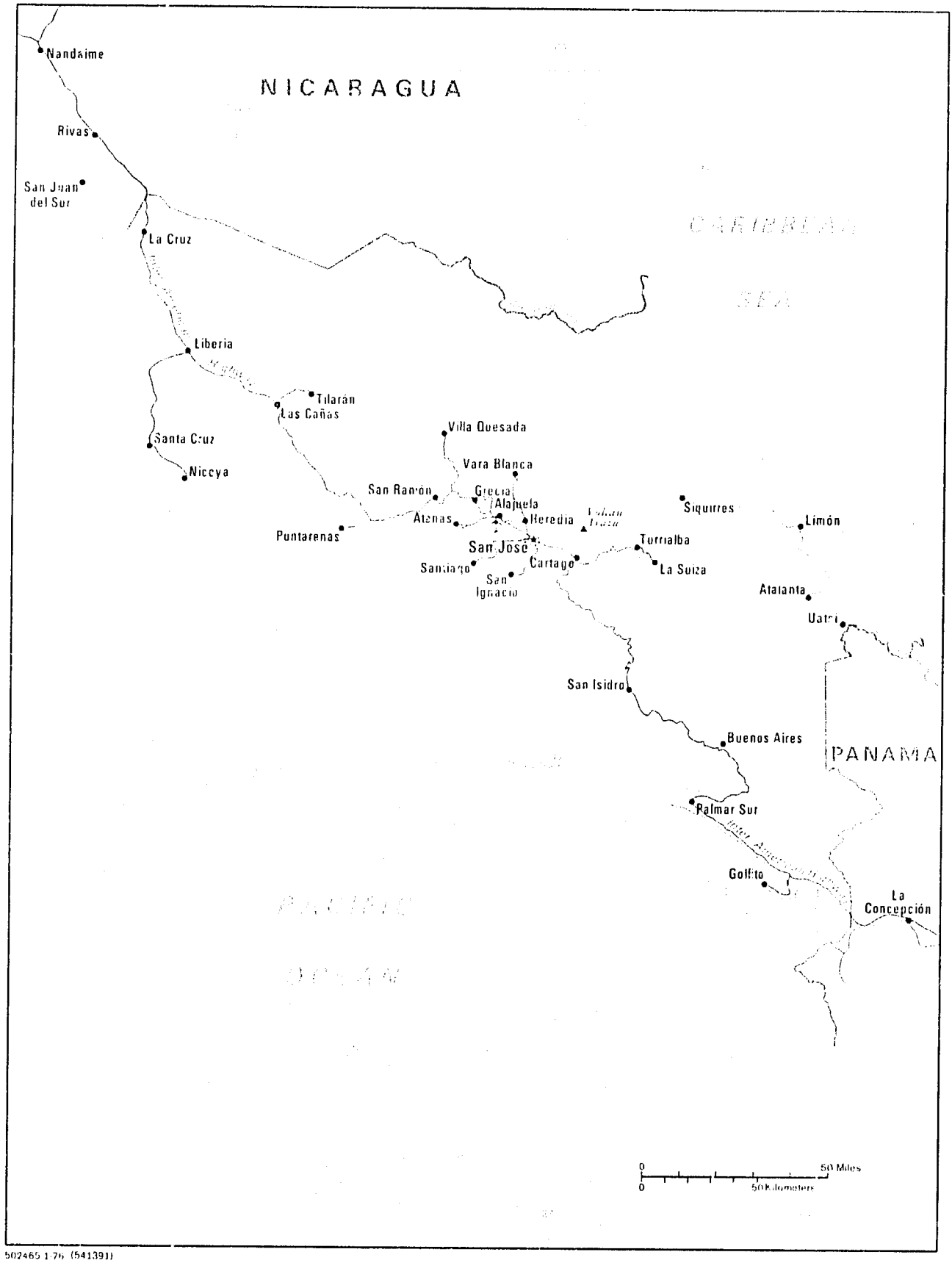
Costa Rica

A Country Profile



Office of U.S. Foreign Disaster Assistance
Agency for International Development
Washington, D.C. 20523

Costa Rica



502465 1-76 (541391)

Lambert Conformal Projection
Standard parallels 9°20' and 14°40'
Scale 1:2,400,000
Boundary representation is not necessarily authoritative

Railroad

Road

Airport

COSTA RICA: A COUNTRY PROFILE

prepared for

The Office of U.S. Foreign Disaster Assistance
Agency for International Development
Department of State
Washington, D.C. 20523

by

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Evaluation Technologies, Inc.
Arlington, Virginia
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The country profile of Costa Rica is part of a series designed to provide baseline country data in support of the planning and relief operations of the Office of U.S. Foreign Disaster Assistance (OFDA). Content, scope, and sources have evolved over the course of the last several years and the relatively narrow focus is intentional.

We hope that the information provided will also be useful to others in the disaster assistance and development communities. Every effort is made to obtain current, reliable data; unfortunately it is not possible to issue updates as fast as changes would warrant.

We invite your comments and corrections. Address these and other queries to OFDA, A.I.D., as given above.

November 1987

OFDA COUNTRY PROFILES: NOVEMBER 1987

1. General Information

1.1 Geographic Codes

AID Standard	515
AID Region	LAC/CAP/CR
State Region	ARA/CEN

1.2 Host Mission to the U.S.

Embassy of the Republic of Costa Rica
2112 S Street, N.W.
Washington, DC 20008
Tel: (202) 234-2945, 2946, & 2947

Costa Rica maintains 39 consulates in 28 U.S. states and Puerto Rico.

1.3 U.S. Mission in Costa Rica

Embassy of the United States
and USAID Mission
Avenida 3 and Calle 1
San José, Costa Rica
Tel: 22-55-66

1.4 Time Zones

GMT - 6
EST - 1

1.5 Currency

1 colón = 100 céntimos
U.S. $1 = 63 colones*

* As of August 1987

1.6 Travel and Visa Requirements

A valid passport and either a tourist card or a visa are mandatory for all visitors to Costa Rica regardless of means of entry. Upon arrival, air travelers must present onward passage and proof of sufficient funds for their stay. Overland travelers must also be prepared to present proof of sufficient funds as well as visas for the countries they will visit.

A tourist card can be obtained for $2.00 through a consulate, travel agent, or any airline servicing Costa Rica. It is good for 30 days but can be extended up to six months upon presentation of a valid passport. For stays over 30 days, an exit permit is required.

Individuals traveling to Costa Rica for business may be required to present a letter, in duplicate, stating occupation, purpose of visit, length of stay, and financial responsibility.

1.7 Holidays

New Year's Day.....January 1
Feast of St. Joseph.....March 19
Holy Thursday.....*
Good Friday.....*
Battle of Rivas.....April 11
Labor Day.....May 1
Corpus Cristi.....*
Sts. Peter & Paul.....June 29
Annexation of Guanacaste
Province.....July 25
Our Lady of the Angels.....August 2
Feast of the Assumption.....August 15
Independence Day.....September 15
Columbus Day.....October 12
All Souls Day.....November 1
Immaculate Conception.....December 8
Christmas.....December 25

* Date varies annually.

Additional local holidays are observed in San José, Limón, and other major cities.

1.8 Treaties and Agreements

Agriculture
Aviation
Consuls
Defense
Economic & Technical Cooperation
Finance
Highways
Investment Guarantees
Mapping
Peace Corps
Postal
Publication
Telecommunication
Trade/Commerce
Visas
Weather Stations

Costa Rica sponsors few bilateral treaties. However, it is a strong supporter of multilateral accords, particularly those of the Inter-American system. (See below.)

1.9 International Organization Memberships

Central American Common Market (CACM)
Central American Democratic Community
Food & Agricultural Organization (FAO)
Group of 77/Non-Aligned Movement
Inter-American Defense Board (IADB)
Inter-American Development Bank (IDB)
International Atomic Energy Agency (IAEA)
International Bank for Reconstruction & Development (IBRD-World Bank)
International Civil Aviation Organization (ICAO)
International Coffee Organization (ICO)
International Development Association (IDA)
International Finance Corporation (IFC)
International Fund for Agricultural Development (IFAD)
International Labor Organization (ILO)
International Monetary Fund (IMF)
International Telecommunications Satellite Organization (INTELSAT)
International Telecommunications Union (ITU)
International Whaling Commission
International Wheat Council (IWC)

1.9 International Organization Memberships (cont'd)

Inter-Parliamentary Union (IPU)
Latin American Economic System (SELA)
Organization of American States (OAS)
Pan American Health Organization/World Health Organization (PAHO/WHO)
Union of Banana Exporting Countries
United Nations (UN)
United Nations Educational, Scientific, and Cultural Organization (UNESCO)
Universal Postal Union (UPU)
World Federation of Trade Unions
World Meterological Organization (WMO)
World Tourism Organization (WTO)

1.10 History

Pre-Independence 1500-1800

On Columbus' fourth and final journey to the New World in 1502, a fierce storm forced his vessel into a protected area off the coast of Limón. There Columbus met Carib Indians during his 18-day stay and traded with them for the heavy gold disks they wore as pendants. Convinced that the land was rich with gold, Columbus dubbed this land "Costa Rica"--or Rich Coast. Rumors of wealth continued to draw explorers and adventurers for years despite a lack of evidence substantiating the claims of riches.

The land was difficult to colonize because the indigenous Indian population was decentralized (unlike in Mexico and Peru) and fiercely resisted the incursion of European adventurers and missionaries. However, by 1522 settlers had established roots and claimed Costa Rica for the Spanish Crown.

In 1568, Spain placed Costa Rica under the jurisdiction of the Kingdom of Guatemala thus distancing the nation from the seat of government and giving Costa Ricans--commonly

known as "Ticos"*--greater independence and freedom. In 1573, Spain delineated the nation's borders, excluding present-day Guanacaste Province.

Throughout the colonial period, a subtle social structure emerged that eventually shaped the present Costa Rican ethos. Small family farms were formed and land distribution was fair and equitable among settlers. Lack of Indians for use as slave labor forced land owners to work their fields for little economic gain.

A social division did exist between the hidalgos (gentry) and plebeyos (commoners). However, the hidalgos accrued only social and political privileges. Because Costa Rica was so poor, the hidalgos could not translate their social position into economic power. As a result of the relative economic equitability among the Ticos, the socially destructive oligarchical structure never emerged in Costa Rica to the extent common in the rest of Latin American.

In 1808, coffee was introduced to Costa Rica from Cuba. The government's offer of free land to those who would grow coffee stimulated the beginnings of a landholding peasantry. Nevertheless, by 1879, two-thirds of the rural population remained landless, serving as laborers on the large fincas (plantations) for wages higher than those garnered by tending their own fields.

Nationalism among the Ticos did not surface until U.S. adventurer William Walker threatened sovereignty in the region. Walker was hired by a Nicaraguan faction to depose Nicaragua's government and unexpectedly declared himself president upon the mission's success. Costa Rica proved

* The Costa Ricans call themselves "Ticos," referring to their own frequent use of the Spanish diminuitive '-ico' or '-tico' which is an ending indicative of affection. The term also connotes national pride.

instrumental in the concerted Central American effort to expel Walker from Nicaragua and Central America in April 1857 during the second battle of Rivas (for which there is a national holiday).

Independence 1821-1889

Costa Rica was initially hesitant about proclaiming independence from Spain because of its fierce loyalty to the motherland and the special priviledges this loyalty had produced for the Ticos. However, Costa Rica eventually followed Mexico and the rest of the Central America in declaring independence from Spain in 1821 and joined the new and short-lived Mexican Empire. After dissolution of repressive Mexican rule, the nation confederated with the United Provinces of Central America in 1823. Costa Rica proclaimed full national sovereignty in 1838 after the Central American union failed.

From independence to 1889, the nation had installed 24 presidents with six appointed as "temporary," 11 indirectly elected, and seven taking the presidency by force.

Beginnings of Democracy 1889-Present

Marking the beginning of Costa Rica's democracy, the first honest and truly free elections were held in 1889. There since have been only two attempts at despotic rule. A military coup by Federico Tinoco Granados in January 1917 replaced Alfredo González Flores' administration which was floundering from an economic crisis. Tinoco lost public support and was refused recognition by the U.S. under President Woodrow Wilson. Tinoco stepped down and U.S. pressure forced another free election in 1920.

The second incident occurred in 1948 after the Legislative Assembly voided the disputed presidential elections. Rafael Angel Calderón Guardia, who instigated the annulment, involved Costa Rica in World War II while he was president from 1940-1944 and used Costa Rica's alliance with the Allies as an excuse to expropriate property and assets owned by wealthy German and Italian

residents. Nevertheless, his 1940 administration instituted the first genuine social and economic reforms. Many came to view his programs as too socialist in nature thereby linking him with the Marxists.

Calderón left the presidency in 1944 but remained an important figure in Costa Rican politics. He hand-picked and manipulated a candidate for the 1948 elections. When Calderón's candidate lost the hotly disputed election, the ex-president pressured the Legislative Assembly into annulling the elections. This act instigated the 1948 Civil War which was eventually won by José Figueres Ferrer and his supporters. Figueres emerged as a national hero and the Costa Rican people called him the man who saved democracy. He was to re-emerge two more times as Chief Executive of Costa Rica in subsequent years. However, his second administration was tainted by his financial association with fugitive Robert Vesco of Watergate notoriety who escaped SEC prosecution in the United States by taking advantage of Costa Rica's political refugee policy.

Current History:

Costa Rica has remained relatively unscathed by turmoil afflicting Guatemala, El Salvador, Honduras, and Nicaragua. Although the nation proclaimed official neutrality in the Sandinista/Contrarevolucionario conflict, the Ticos were hardly neutral in the Somoza/Sandinista civil war that ended in 1979. The Carazo Odio administration (1978-1982) supported the Sandinistas in their quests to overthrow Anastasio Somoza Debayle and to end a multi-generational tyranny that had ruled the country since the early twentieth century.

An affinity developed between the Ticos and Eden "Commander Zero" Pastora Gómez, hero of the August 1978 attack on Managua's National Palace in which the entire Nicaraguan Congress was taken hostage. Yet the Luis Alberto Monge Alvarez administration (1982-1986) was not as kind to the Sandinist-hero-turned-Contra. As incursions from across the border increased, a national

alert was declared in May 1982 and Eden Pastora Gómez was expelled from Costa Rica.

The Ticos have made considerable efforts over the past few years to placate the Sandinist government. Actions taken against Sandinist opposition operating within the country, the cancellation of a U.S.-financed plan to use U.S. National Guardsmen to construct roads close to the Nicaragua-Costa Rica border, and repeated public statements of neutrality have been made in an attempt to ward off Nicaraquan aggression.

However, border incursions between the Contras and Sandinistas have drawn Costa Rica into the conflict despite the 1983 proclamation of neutrality. Security concerns have become a prime consideration for successive administrations. Costa Rica eliminated its national army through the 1949 Constitution and relies heavily on collective arrangements such as the Inter-American Treaty of Reciprocal Assistance (Rio Treaty) and its close relationship with the United States. The Monge administration instituted the Organización para Emergencias Nacionales (OPEN) fueling speculations that the re-establishment of a national army was not far behind.

Border clashes are common and have contributed to the serious deterioration of relations between the two neighbors. However, other repercussions directly related to the regional civil wars influence Costa Rica today. Its "open door" policy to political dissenters drew so many from neighboring countries in the 1980s that the group of Central American refugees now constitutes the nation's largest minority. With the refugees came political violence, kidnappings, and terrorism on a scale previously unknown to Costa Rica. (See also section 2.8, Refugees and Illegal Aliens.)

Terrorist activities within Costa Rica during the early 1980s were not directed against the Ticos but other foreigners, particularly Central American refugees. Terrorists operated from both leftist (FSLN, Che Guevara Commando, and the Carlos Aguero Commando--a group of exiled South American leftists) and rightist (former members of Somoza's National Guard) power bases.

1.11 Government

Political Divisions:

Figure 1.a.

Seven provinces constitute the nation of Costa Rica. (Refer to Figure 1.a.) The provinces are divided into cantons which are further sub-divided into districts. In 1983, there were a total of 81 cantons and 418 districts. The following includes the names of the provinces, capitals, and the number of cantons and districts in each province:

Province	Capital	Number of Cantons	Number of Districts
ALAJUELA	Alajuela	15	106
CARTAGO	Cartago	8	47
GUANACASTE	Liberia	11	47
HEREDIA	Heredia	10	43
LIMON	Limón	6	23
PUNTARENAS	Puntarenas	11	44
SAN JOSÉ	San José*	20	107

* National Capital

National Government: Despite the upheaval afflicting most of its Central American neighbors, Costa Rica continues to serve as a shining example of democracy. Stability of authority has been endemic to the nation since José Figueres Ferrer and his supporters emerged victorious from the 1948 civil war--a conflict provoked by electoral fraud. After Figueres was installed as president of the Founding Junta of the Second Republic (an 18-month interim body that stepped down on November 8, 1949) and later in his first presidency in 1954, he succeeded in reuniting the nation, eliminating the inept and instigative army, and drafting a new constitution that restructured the government and reaffirmed Costa Rica's commitment to democracy. The 1949 Constitution, a document that outlines an elaborate system of checks and balances, provides for presidential veto, limitations on legislative and executive terms of office, interpellation of ministers,

impeachment proceedings, and the provision of independent status to various state-related automonous institutions.

Federal powers are divided among the following three branches:

1. Executive Branch

Latin American governments have typically afforded the Executive Branch, particularly the President, the majority of political power. Costa Rica is no exception, but power is much less concentrated in the hands of the Chief Executive and is much more dispersed throughout the entire branch than in counterpart bodies in the rest of Latin America. The President, however, undisputably retains most political power not through Constitutionally mandated directives--which are very narrowly defined--but through powers of appointment, discretionary power in implementing laws, and joint functions with appropriate ministers.

The president serves a single four-year term and cannot be re-elected. Two vice presidents assist the Chief Executive and are assigned no duties by the Constitution. As a matter of fact, the second vice president does not receive a salary. The Executive Branch also includes a Cabinet of Ministries that varies in number from election to election and a Council of Government which includes the president, vice presidents, and ministers acting as a single entity.

2. Legislative Branch

The Legislative Assembly, a unicameral body, comprises 57 deputies elected every four years for a single term. Seats are periodically reapportioned as population shifts occur in the seven provinces. Regular sessions last six months and begin every May. However, the President may convene extraordinary sessions. The 1949 Constitution charges the General Assembly

with approving the national budget, granting the president power to declare a state of emergency, levying taxes, and enacting laws.

Legislation is introduced by either individual deputies or the Executive Branch. Most work on bills is done within five committees (Government/Administration, Economic, Budget, Social, and Judicial Affairs). Because deputies may not serve consecutive terms, a new group of elected officials--often young lawyers and rural elites primarily interested in establishing contacts for future careers--emerges regularly.

3. Judicial Branch

A three-chamber Supreme Court executes two mandated tasks: (1) analyze the constitutionality of acts of the legislative and executive branches and (2) serve as the final court of appeal. Other powers have been bestowed on it through legislative action, particularly supervision of the inferior courts and installment of judges to lower courts. The Legislative Assembly appoints the 17 high justices who serve eight-year terms. Unlike members of the Legislative Assembly or the Presidency, Supreme Court judges may serve more than one consecutive term.

Autonomous Organizations:

Another feature of the Costa Rican government is the group of autonomous or semi-autonomous entities that independently execute legislative, executive, and private-sector functions. Banking, Social Security, railroads, insurance, oil refineries, urban planning, and universities are a few of the areas that are directed by autonomous agencies. Probably the most important organizations acting independently of the government are the Costa Rican Development Corporation (CODESA) and the Costa Rican Institute of Electricity (ICE). The Constitution protects their independence. The president nevertheless can influence the direction of the organization through his mandate to appoint agency directors.

Because these entities are considered public sector offices, their growth has added to the enlargement of Costa Rica's bloated, politically influential bureaucracy. Critics argue that many functions of the agencies should be given over to the private sector which could provide goods and services much more competitively and efficiently.

Local Government: The presidentially appointed provincial governors have been reduced to virtual figureheads since 1970 when they were stripped of their already minimal role as intermediaries between the federal government and the cantons. Real local power today lies with the canton administration where authority is vested in a municipal council. The municipal council is located in the canton's chief city and consists of two types of members--the regidores (voting members) and sindicos (non-voting members) selected from each of the canton's districts. It is chaired by a "jefe politico" (political boss) appointed by the President. However, municipal councils are so restricted in the extent of their power and finances that they often must look to the autonomous agencies and the national government to resolve local problems.

Recent Elections: Elections, which are compulsory for those over 18, are held every four years on the first Sunday in February. The latest election was held on February 2, 1986, when Oscar Arias Sánchez won 52.3% of the vote. He succeeded fellow National Liberation Party (PLN) member, Luis Alberto Monge Alvarez, which is rare because the PLN usually alternates the presidency with other political parties. The PLN, the party founded by José Figueres Ferrer, is the only party remaining from the Civil War era. It is common for Costa Rican political parties to merge with other groups to form a strong coalition as an alternative to the PLN.

President Arias Sánchez has already gained international recognition by authoring a new peace plan for the Central American region which was approved by the leaders of the five Central American nations. President Arias was awarded the Nobel Peace Prize in 1987 for his efforts in attaining regional peace.

1.12 Ethnic Groups

The Costa Rican people are strikingly homogeneous and generally accepting of the few minorities residing within the nation. Over 95% of all Costa Ricans claim roots in European, particularly Spanish, ancestry. Of this group, a small portion are "mestizo"--those of mixed Spanish and Indian blood. Lack of prejudice toward the mestizo, their small numbers, and assimilation have clouded the distinction between them and the European descendants, a division that taints ethnic relations in much of Latin America. Most mestizos are found in Guanacaste Province, where intermarriage was once common between European settlers and Indians residing in the region.

A wave of immigration in the 19th century introduced not only more Spanish settlers but many of German, British, French, Chinese, Italian, Dutch, and Swiss extraction. Acculturation and assimilation reduced ethnic barriers between the newcomers and the Ticos. Over the years, a uniquely Costa Rican form of Spanish-American culture evolved and was adopted by almost all regardless of ancestry or place of origin.

However, recent patterns of immigration are rapidly changing the ethnic makeup of Costa Rican society and are imposing new values and mores on the populace. Costa Rica's generous policy of providing asylum for those affected by political repression has drawn over 250,000 Guatemalan, Salvadoran, and Nicaraguan refugees and illegal aliens. They have become the largest minority group representing 10% of the population in 1985.

The Arias Sánchez Administration anticipates that this minority will continue to increase in the near term due to rising tensions, hostilities, and fighting in Central America. By exacerbating unemployment and straining the socio-economic infrastructure, the new Central American immigrants face increasing resentment. The government may be forced to reexamine its "safe-haven" law.

The eastern shore of Limón Province is home to Costa Rica's second largest minority--blacks who emigrated or were brought as slave labor from Jamaica and other West Indian islands in order to work in railroad construction and on banana plantations. They constitute approximately 3% of the population and until recently have jealously preserved their West Indian culture, maintaining English Creole as their primary language. Despite the comparative acceptance of minorities in the country, black Costa Ricans were prohibited by law from migrating to the central highlands and southwestern banana plantations until the mid-1940s. Younger generations, however, are now being absorbed into the mainstream of Costa Rican society as they leave the Caribbean lowlands in search of better jobs and educational opportunities in the Meseta Central.

Within the past 30 years, Costa Rican officials have counted and categorized the country's small Indian population. The largest group was named Talamanca, after the region to which they were moved and restricted, and comprises two different factions (Bribri and Cabécare) that share languages of the same family and a few other superficial similarities. While part of the group have assimilated to Costa Rican culture the majority have held strongly to ancient customs and agricultural methods. The second category comprises Boruca Indians who populate the southern Pacific region. They have rapidly adopted Spanish-American ways since the completion of the Inter-American Highway that runs close to their communities. The final group, the

Chortega-Mangues, are interspersed with the resident mestizos. Most of their cultural mannerisms and beliefs have been eroded.

Socio-Economic Groups:

The first Spainsh settlers came to "Costa Rica" expecting that it was indeed a Rich Coast. What they found, to their dismay, was a large amount of uncultivable and resource-poor land. From the initial poverty and discouragement shared by the first Costa Ricans, a common ethos emerged: everyone was poor yet independent, and equal opportunities to achieve social and economic progress were available to all.

Because conditions were not conducive to easy and quick wealth, an all-powerful oligarchy did not emerge and act to monopolize the economy and suppress political democracy to the extent that is common in most of Latin America. Also, Costa Rica has not had the historical land-ownership concentration that often results from the oligarchical social structure and subsequent problems of equitable land distribution. Finally, a strong and populous middle class, uncharacteristic of Latin America, emerged to provide social stability. Animosity between the rich and the rest of the population is limited due to the shared belief that upward-mobility is possible.

1.13 Languages

Spanish is the official language of Costa Rica and is spoken by 97% of the population. However, many Costa Ricans also speak English as either their primary or secondary language. Blacks living on the east coast in Limón Province speak a Jamaican form of English.

Costa Rican businessmen and industrialists find it increasingly beneficial to gain proficiency, if not fluency, in English.

The remaining five national languages are Indian dialects derived from the Chibchan family. They are not widely used outside of the various Costa Rican tribes. With the sole exception of the Talamancan Indians who are fighting to retain their traditions and ethnicity, the various dialects are being replaced by Spanish through the process of acculturation.

1.14 Religion

A vast majority (95%) of the population claim communion with the Roman Catholic Church. Despite the growth of non-practicing Catholics, the Church has retained its strong social influence over the population.

Church-government relations are assymetrical. The government often lends financial support to the Church. Yet, upper-level clergy historically have refrained from political activity, unlike their counterparts in neighboring Nicaragua and El Salvador. Other religious practices, including Judaism and various Protestant denominations are tolerated and protected by the Constitution.

1.15 Geography

Location & Area:

Costa Rica is the third smallest Central American country covering a total 51,100 sq. km (or about the size of West Virginia). Nicaragua shares its northern border and Panama lies to the south. Being an isthmian nation, Costa Rica has both Caribbean and Pacific coastlines which are geographically as different as night and day. The flat, open Caribbean shore is only 210 km long while the irregular, rocky Pacific strand spans approximately 1,016 km.

Through a 1900 agreement between Costa Rica and Panama, Costa Rica acquired the tiny Isla de Coco, a 24 sq. km island located 483 km off the Pacific coast. The island has no permanent inhabitants and is designated as one of Costa Rica's 24 protected national parks or related reserves. It serves a strategic value in defense of the Panama Canal.

Geographically, Costa Rica can be divided into three distinct regions: the central mountainous corridor, the Pacific coast, and the Caribbean lowlands. Rivers are abundant. They start in the cordilleras, or mountain ranges, and travel toward either the Pacific Ocean or the Caribbean Sea. The sole exception is Rio Frio which flows toward Lago de Nicaragua in the southwest corner of Nicaragua.

Climate:

The climate varies according to elevation and trade winds. Two-thirds of the Ticos live in the Meseta Central in the mountainous interior at elevations between 900 m and 1800 m. The climate is temperate. Representative average daily temperatures for San José include (in Centigrade):

REPRESENTATIVE TEMPERATURES FOR SAN JOSÉ
(°C)

Jan		Apr		Jul		Oct	
Max	Min	Max	Min	Max	Min	Max	Min
23.9	14.4	26.1	16.7	25.0	16.7	25.0	15.6

Source: U.S. Department of Commerce, Environmental Data Services, Climates of the World. (U.S. Government Printing Office 1972), p. 11.

The length of the rainy season averages from all year in the Caribbean lowlands to six months in regions of Guanacaste Province on the Pacific coast. For more detailed geographic information, refer to section 2.1, Overview of the Physical Environment.

1.16 Population

Demographics:

Total Population.....2,460,226 (1984 Census)
Density/sq. km.....48.1
Life Expectancy
Males.....71 years
Females.....76 years
Average Growth Rate
1980-1985.....2.8%

* *

Urbanization:

Urban Population as % of Total Population
1984.....48
Average Annual Growth Rate
1973-1984.....3.3
% of Urban Population in San José
1980.....64
1960.....67

Sources: Government of Costa Rica, Dirección General de Estadisticos y Censos and the World Bank, World Development Report 1986

* *

Over half of the Costa Rican population is concentrated on only 5% of the national territory. The San José Metropolitan area --located in the central mountain chain and comprising the cities of San José, Alajuela, Heredia, and Cartago--has attracted many Costa Ricans and has become the most densely populated area in the country. Other well-settled regions include locations south and west of the Valle Central. The Caribbean lowlands, southwestern Puntarenas, northwestern Guantacaste, and northwestern Alajuela provinces are sparsely populated.

In addition to the provincial capitals, major population centers include Puntarenas, Nicoya, Golfito, Desamparados, Guadaloupe, San Pedro, San Isidro del General, Ciudad Quesada, and Turrialba. The following presents population statistics by province and provincial capitals:

COSTA RICAN POPULATION
BY PROVINCE
(based on the 1984 Census)

PROVINCE	Population[1]	Capital	Capital Population[2]	% of Capital Population to Total Provincial Population
SAN JOSÉ	893,254	San José	245,370	27.5
ALAJUELA	430,634	Alajuela	33,929	7.9
PUNTARENAS	291,008	Puntarenas	47,851	16.4
CARTAGO	269,860	Cartago	23,884	8.8
HEREDIA	195,389	Heredia	20,867	10.7
GUANACASTE	193,024	Liberia	14,093	7.3
LIMÓN	187,057	Limón	43,158	23.1
NATIONAL	2,460,226	SAN JOSÉ	429,152	17.4

1 Facts and figures - 1985 by GORC
2 Europe Yearbook - Costa Rica 1986

Urbanization:

While Costa Rica is the second most urbanized country in Central America, it is considered much less so than Mexico and most of South America where urban concentrations range from 41% in Paraguay to 85% in Venezuela, Uruguay, and Argentina. Such high levels of urbanization have caused significant social and political problems in these countries.

Costa Rica has not been exempt from the strains of rapid urbanization. Migration to the urban centers continues at a rapid pace often outstripping the ability of city planners and local governments to provide adequate housing, employment, and municipal services. Through CODESA (the Costa Rican Development Corporation) and its regional affiliate JAPDEVA (the Council of Port Administration and Development of the Atlantic Shelf), the GOCR is encouraging migration into the sparsely populated areas of the northern Atlantic littoral. Irrigation and land reclamation projects and improved transportation via the Tortuguero Waterway offer incentives for settlement and agricultural development of the region. By 1984, 48% of the population resided in urban areas while 52% lived in the country.

Population Growth Rate:

From 1960 to the present, Costa Rica has made tremendous strides in reducing its natural rate of population growth. The annual rate peaked in 1960 at 4.1% after two decades of incremental growth. The augmentation occurred due to slightly increasing growth rates and a marked decrease in mortality rates--particularly infant mortality. The government instituted a national family planning program in 1968 which established clinics in both urban and rural areas to provide advice, dispense contraceptives, and assist in re-orienting women to think of three to five children as a reasonable family size versus the seven- or eight-child families of earlier generations. The campaign successfully reduced the natural rate of growth to 2.5% in the early 1970s, an achievement matched by few countries. The population growth rate is again beginning to climb principally because women born during the baby-boom years have entered their childbearing years. The large influx of Central American illegal aliens and refugees is also exacerbating problems associated with population growth.

In 1983, the age of the Costa Rican population was structured as follows:

Under 15.....37%
15 to 64.....59%
65 and older..... 4%

1.17 Health, Nutrition, and Diet

Basic Indicators:

Crude Birth Rate/1000 (1982)	30.7
Crude Death Rate/1000 (1984)	3.9
Male (4.3)	
Female (3.4)	
Life Expectancy (1980-1985)	73.0
Males (70.5)	
Females (75.2)	
Number of Physicians	2,539
Ratio of Physicians/1,000 Inhabitants	10.1
Number of Nurses	1,300
Ratio of Nurses/1,000 Inhabitants	5.2
Number of Hospital Beds	6,776

Daily Calorie Supply/Capita	2,803
% of FAO daily requirements	118

Source: Dirección General de Estadisticas y Censos, PAHO, World Bank, and Costa Rican Ministry of Health.

* *

Health Overview:

Ticos live longer than most people in developing nations due to an effective public health campaign. Control and prevention programs, as administered by the Ministry of Health and the Social Security Commission (CCSS), have substantially decreased morbidity and mortality rates. There are both more doctors per capita and greater per capita expeditures on health care than in any other country in Central America as well as in many more developed South American nations. The health sector receives the greatest portion (22.5%) of the federal budget. And the vast majority of Ticos (94% in 1985) and registered refugees are covered by social health programs.

Costa Rica established a national medical care system in 1973. Since then, prevention and control programs eliminated or greatly reduced the incidence of diseases endemic to tropical developing nations. In 1970, major causes of death included childhood communicable diseases such as diarrhea, diphtheria, pneumonia, and intestinal parasites. With successful development, Costa Rica now faces new threats; its epidemiology closely resembles that of developed nations with cardiovascular diseases and cancers representing two of the top killers. In 1982, 41.3% deaths were attributed to cardiovascular illnesses and accidents. Other common killers today include respiratory diseases and poisonings.

Despite higher incidences of cardiovascular and cancer deaths, emergency medical technicians (EMTs) and paramedics are virtually non-existent. Other infrastructure such as cardiac facilities at hospitals and advanced cardiac life support (ACLUs) are either very new or do not exist. In 1985,

Project Hope reported a need for approximately 1,000 to 1,500 EMTs and 200 certified paramedics. Costa Rica, at the time, had no EMTs and only eight paramedics to service the entire nation. Finally, the government imports virtually all medicine.

Successes in the health sector are nevertheless outstanding. Many diseases have been eliminated or sharply reduced. Of eight tropical diseases targeted by the World Health Organization (WHO) for global eradication, only malaria and leishmaniasis are still problems, albeit insignificant. Moreover, health care is as readily available in rural areas as in urban sectors. For a detailed analysis of the structure of Costa Rica's health system and available infrastructure, see section 3.4.

Nutrition:

In general, sufficient food supplies are available. While increasingly agricultural land and pastures are devoted to export production, the government has the resources to import enough food to fill the gap not met by domestic production. Yet, there are families who cannot purchase enough food. Particularly affected are the poorest 10% of society and the illegal immigrants not provided for by the UNHCR and the Costa Rican government.

Severe forms of malnutrition--such as kwashiorkor and marasmus--are being eliminated. Increased meat consumption in the average diet over the past 20 years has fought debilitating protein deficiencies. The introduction of iodine-rich foods and iodized salt has cut goiter, common in the highlands, by 60%.

However, malnutrition is appearing at an earlier age and due to different causes. Severe bacterial and viral infections, parasites, congenital and other pre-natal defects, psycho-motor retardation, and child abuse have replaced food deficiency as the primary causes of malnutrition among children. Increasing economic difficulties and decreasing social services undoubtedly will augment the number of food-related cases of malnutrition.

Diet:

The diet of rural Ticos resembles food consumption patterns in other Central American nations. Milk, rice, coffee, beans, sugar, corn tortillas, fruits, and vegetables constitute primary food staples. When available fresh beets, carrots, cabbage, spinach, grapefruit, oranges, lemons, limes, and bananas supplement traditional dishes. Residents of the urbanized Valle Central prefer a varied diet that includes meats, white bread, pastas, and fresh fruits and vegetables. Their demand for wheat and other foreign products forces the government to import increasing quantities of food to meet changing consumer preferences. Because of the diet variations and larger intake of animal protein and fat, Costa Rican's suffer from heart disease and obesity-related problems.

Until World War II, the nation imported beef to satisfy domestic demand. Now, beef, the over-whelming favorite meat, is raised for export and for internal consumption. It is relatively cheap and available. Pork is a traditional favorite in much of Latin America; however, little is produced domestically due to the high cost of imported feed stock. Most pork also must be imported. Because fish spoils easily in tropical climates, Ticos eat little fish. A dislike of frozen seafood and the low cost of beef also promote low fish consumption. Finally, Costa Ricans love sugar and eat it in large quantities.

1.18 Education

Costa Rica has long been committed to a goal of universal education. Since 1973, matriculation has been compulsory for all children between the ages of 6 and 13. The following indicates the percentage of students attending school by age group in 1984:

Level	Age	% Attending
Primary School	6-12	102
Secondary School	13-18	44
Higher Education	19-22	26

The national government has made large investments in the educational system. The Ministry of Public Education is among the largest bureaucratic bodies in terms of employees and resources. Although education suffered a drastic budget reduction in the early 1980s in response to the nation's severe economic crisis, it is still allotted 20% of the national budget. Costa Rica's consistent emphasis on education has produced the second highest number of university enrollees per capita in Latin America.

Five institutions of higher learning constitute Costa Rica's university system and all have recent roots. The San José-based Universidad de Costa Rica (UCR), founded in 1940, was the first Costa Rican university opened since 1888. The UCR has affiliate campuses scattered throughout the provinces.

The José Figueres Administration of 1973 founded Costa Rica's second major university, the Universidad Nacional Autónoma (UNA), as an alternative to the UCR. Figueres viewed the UCR as an elitist institution catering to the upper and upper-middle classes and not designed to address the practical problems facing Costa Rican society. The Heredia-based UNA has regional affiliates serving the outlying areas.

The Instituto Tecnológico de Costa Rica, founded in 1971, promotes higher education in the technical and agricultural fields.

The only institution that functions solely on private funding is the Universidad Autónoma de Centra América (UACA), founded in 1976.

The newest institution is the highly experimental Universidad Estatal a Distancia, opened in 1978. Through this university, the government offers courses for credit via television programming. It is a unique project designed to decentralize university attendance and to offer higher educational opportunities to rural dwellers or others who cannot finance tuition and room and board in San José or Heredia. It has been successful primarily due to the high number of televisions in both the rural and urban areas. (See Section 1.20 Communications.)

In the past, a few students were sent to higher educational institutions in Europe. The pattern, however, has shifted. Students are now drawn to universities in the United States, Argentina, and Chile.

1.19 Economy

Basic Indicators: (1985)

Gross Domestic Product (GDP)	$3,810,000,000
Distribution of GDP (%)	
Agriculture	20
Industry	29
Services	51
Average Growth Rate of the GDP (%)	
1965-1980	6.3
1980-1985	.5
Gross National Product/capital	$1,300
Annual Inflation Rate (%)	
1965-1980	11.2
1980-1985	36.4
Overseas Development Assistance (all sources)	
1979	56,000,000
1982	80,000,000
1985	280,000,000
per capita assistance 1985	107.7
% of GNP 1985	8.0
Public Expenditures (%)	
Defense	3.0
Education	19.4
Health	22.5
Housing, Soc. Security & Welfare	17.1
Economic Services	20.2
Other	17.8

* *

General:

The Costa Rican economy depends on private enterprise and practices open-market policies. Yet despite its commitment to capitalism, the government actively participates in the economy through regulation and public sector corporations. Public-sector enterprises include airlines, banks, public utilities such as telecommunications and electricity, and other interests. In addition, the government has been involved in banana production since 1984.

Agro-pastoral activities constitute the basis of the Costa Rican economy. Manufacturing has evolved and contributed to employment, export earnings, and a diversified industrial base. Yet, import-substitution industries never took hold and existing manufacturers depend upon expensive imports such as spare parts and oil. The impact of manufacturing--80% of which is based in the Meseta Central--on overall development has been minimal. Finally, the service sector has become very important by absorbing the majority of Costa Rican workers.

Regionally, Costa Rica's economy was the strongest prior to 1980. Guatemala and El Salvador have traditionally had a more developed economic base and internal markets, yet Costa Rica's economic growth rates were consistently higher than all Central American countries. Political stability attracted foreign direct investment and American retirees with dollars. Social services provided through government spending were among the best in the entire hemisphere and provided foreign companies with a pool of young, highly educated workers. The overall ambiance had attracted over 300 U.S. firms and more than a dozen non-U.S. multinational corporations.

But Costa Rica's economy has deteriorated since its 1981 crisis. National annual inflation rates between 1980-85, averaging 36.4%, were the highest in the Central American region, including Nicaragua which faced a U.S. economic embargo and civil war.

High nominal interest rates (deposit-16.5%; lending-20.92% in 1985) encouraged savings and discouraged borrowing. The crisis threatens to destroy income redistribution achievements of the past decade.

Labor:

% of Population of Working Age (15-64 years) 1985		59
Average Annual Growth of Labor Force (%) (1980-1985)		3.1
% of Labor Force in:	1980	1965
Agriculture	31	47
Industry	23	19
Services	46	34
Total Work Force (Nov. 1985)		925,000

Source: World Bank. World Development Report 1986.

* *

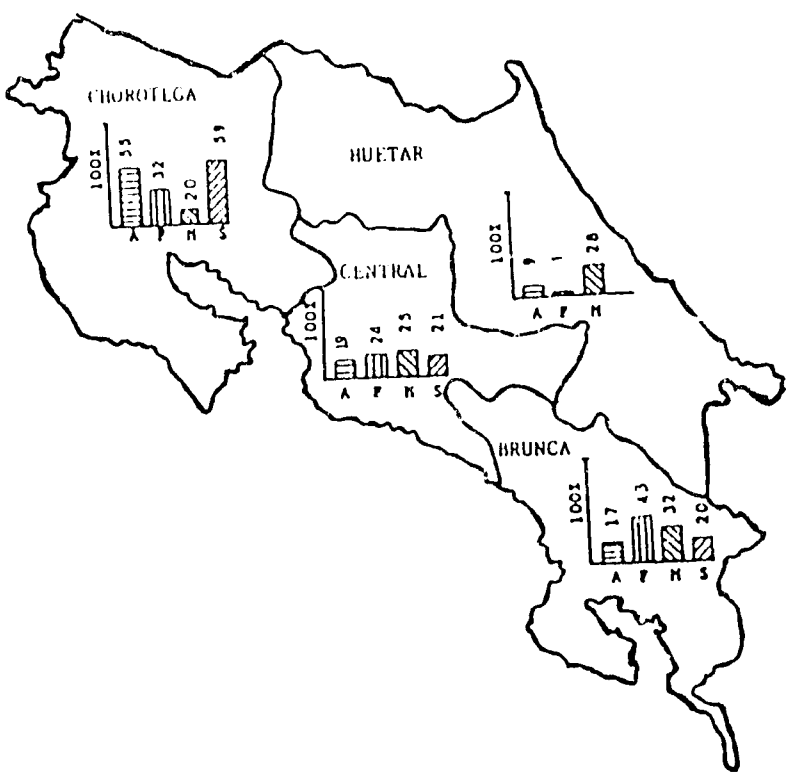
Unemployment and underemployment have declined considerably since 1982. In March 1982, 21.3% of the work force had either no job or one that underemployed them. By March 1985, the figure dropped to 14.5%. Open unemployment was only 6.3% in 1985. However, Costa Rica will find it difficult to continue this trend. The labor pool expands by 3.1% annually. Therefore, national economic growth must match or surpass this increase in order to absorb new entrants without adding to unemployment. Growth rates have not, and are not expected to, reach 3.1%.

Only 15% of all labor is organized. Of the existing 286 unions, few organize industrial workers, who are often managed by foreign owners. Private sector unions are generally weak. The strongest unions include government bureaucrats, transportation workers, and employees of United Brands and Standard Fruit. Unions affect government policies only minimally.

Agriculture:

Agricultural production is the basis of Costa Rica's economy although it employs only 31% of the national work force and contributes 20% to the gross domestic product (GDP). It nevertheless provides 60% of the nation's vital foreign exchange earnings and its labor force was the fastest growing absorbing an average 3.8% workers per annum from 1965 to 1980. In addition, agriculture was the only sector to register substantial growth (2.1%) during the 1980-1985 period.

The Agriculture and Livestock Ministry administers four agricultural regions: The Meseta Central (Central) the Caribbean Lowlands (Huetar Atlantica), Guanacaste Province (Chorotega), and the Pacific Southwest (Brunca). Principal subsistence products include rice, beans, corn, and sorghum. The Centro para Investigaciones en Granos y Semillas (CIGRAS) at the Universidad de Costa Rica identified the relative distribution of grain production by zones as follows:



A = rice F = beans M = corn S = sorghum

Other crops grown for domestic consumption include plantains, potatoes, onions, and to a lesser extent cassava, cotton, and tobacco.

Bananas, coffee, cattle, sugarcane, cacao, and livestock are grown principally for export. Sugar, cacao, fruit trees, and subsistence products such as corn, beans, and yucca are grown on small farms. Costa Rican coffee, high quality and a high yield/acre product, is produced on small, medium, and large landholdings. However, over 50% of the coffee is produced on only 5% of all farms, particularly on plots in the Meseta Central. Large farms concentrate on beef, cattle, bananas, sugarcane, cacao, and rice. Three foreign firms--Del Monte, Standard Fruit, and a subsidiary of United Brands--monopolize banana production. All operate in Limón and southwestern Puntarenas provinces. United Brands and Standard Fruit produce the majority of bananas for export. All three companies accounted for 95% of banana exports by 1980.

The National Production Council (CNP), an autonomous institution, works in conjunction with the Ministry of Agriculture and Livestock and implements such programs as the promotion of price supports, agro-pastural activities, and food processing (i.e., production of liquor and alcohol). The CNP maintains silos and warehouses. The following demonstrates CNP food storage capacity as of 1985:

FOOD STORAGE CAPACITY
National Production Council
CNP

Location	Plants	Sites (MT Capacity)	Warehouses (MT Capacity)
Barranca, Puntarenas	Silos Barranca	21,825	13,000
Heredia	La China	12,488	910
Palmar Sur	Terraba	10,800	3,000
Guanacaste	Liberia	14,545	0
Quepos	La Managua	10,800	3,000
	TOTAL	70,458	19,910

Source: Consejo Nacional de Producción (CNP), 1985

Other duties of the CNP include importing primary materials and agricultural inputs. The CNP is the only agency mandated to import grains. It also runs retail stores that compete with private businesses to keep food prices down.

In late 1984, the Costa Rican government reluctantly entered banana production. United Brand workers at the Golfito plantation earlier fomented a strike for higher wages. Rather than conceding to union pressure, United Brands announced that it would close plantations along the Pacific coast. The Costa Rican government feared the impact that the closure would have on the economy and negotiated an agreement with United Brands through which it would lease the land from the company for the next four years. The government could have expropriated United Brands' property because the company broke a contract with the government. However, Caribbean Basin Initiative (CBI) regulations view national expropriation as a reason to cut all U.S. aid to a country. Costa Rica's reluctance to expropriate suggests its present dependence on U.S. financial assistance.

Despite its propensity to produce food to meet total domestic damand, Costa Rica has been increasing food imports, particularly wheat and other food grains which account for one-third of all agricultural imports. Low yields and the high cost of producing some crops on medium and smaller plots make various agricultural imports highly competitive. In addition, export products draw higher prices and income. Yet, the most important reason for food importation is the degradation of existing land.

As section 2.7 describes, almost all land suited for agricultural activity is being used. Poor land clearing and husbandry methods have caused a vicious cycle to emerge where land is cleared and planted in the annual crops. Farmers then change the type of crops and plant export products such as cacao or coffee. The topsoil is washed away and land will no longer profitably

support crops, so farmers then use the plot as grazing land for cattle and other livestock until the land further deteriorates and becomes useless.

Agricultural yields increased during 1970-1980 because of expanded land use. Rising productivity was an insignificant factor. This artificial growth can be attributed to governmental policies aimed at counteracting land erosion and exhaustion which was already occurring by 1970. Forests were cleared, more land was made available, food importation became an institutional policy, and the use of fertilizers and pesticides was promoted.

Like foreign loans fueling public sector growth, these policies avoided the real problem of agricultural stagnation. Environmental degradation, the persistence of urban slums, progressive depopulation of rural areas, urbanization of arable land, and increased land prices were the result. However, almost all land suitable for agriculture or livestock has been claimed and much of it is being intensively farmed. Future yield increases will depend on increased productivity and changes in technology.

Because the outlook for increased agricultural output in the short-term looks bleak, the government must depend on increasing food imports. Costa Rica initiated participation in the U.S. AID PL-480 Title I food assistance program for the first time in 1982. Through the program, the government sells U.S. food to citizens and agrees to invest all proceeds to stimilate faster agricultural sector development. The government purchases wheat through the Title I program and stores it at two privately owned milling plants in Puntarenas and near Alajuela.

Land Distribution: A land-holding oligarchy never developed to the extent common in the rest of Latin America. Most agriculturalists worked their own plots. The introduction of coffee initiated land concentration and the

ownership of large parcels in the Caribbean lowlands by foreign banana interests which skews today's land distribution patterns. Various factors such as the lack of modern agricultural technology and the inability to mechanize medium and small plots due to the difficult terrain have further inhibited extensive land concentration today. Land is most intensively farmed in the Meseta Central, followed by the Pacific slope in central and southwestern Puntarenas Province. Farms remain relatively small in the Meseta Central region.

More than 42% of Costa Rican land can be used for crops or grazing although more and more of the 30% area conducive to forestry is also being cleared and used for agriculture. Ten percent of farm units--particularly the large banana, cattle, and coffee estates--constitute 75% of the available agricultural land. There are approximately 114,000 farms of which 50,000 are under .7 ha, 28,600 are between .7 ha and 7 ha, and 23,400 incorporate 7 ha and 344 ha. The remaining are over 344 ha.

Owners of 80% of all estates cultivate their land. Only 2% of the farms use renters to work the land. Two principal systems of land tenancy exist: the esquilimo system where renters work for a single harvest season and the medieria system where the owner provides all but the labor. Colonos or precaristas are squatters. They have increased demands on the government to redistribute idle land or land of excessively large estates.

By the early 1980s, thousands of families sought land and many resorted to squatting. The situation intensified as the economy deteriorated. Despite ex-President Monge's campaign for Ticos to 'Return to the Land," his administration, through the Guardia Civil, dealt firmly with squatters expelling them from plots. Squatter tradition and the law promoting land improvements have given squatters some rights.

International Trade: (1985 Figures)

Balance of Payments	
Exports	957,000,000
Imports	1,108,000,000
Current Account Deficit	- 168,000,000
International Reserves	526,000,000
(in months of Import Coverage)	3.8
Terms of Trade (1980=100)	97

* *

Costa Rica promotes an outward-looking economy favorable to foreign trade and investment. The agricultural sector produces the majority of export products although it contributes only 20% of the GDP. Because the economy is dependent on a few agro-pastoral exports--namely coffee, bananas, beef, and sugar--export earnings are hostage to volatile fluctuations of world commodity prices. Coffee and bananas together generated 54.5% of foreign exchange in 1982 and usually average about 50% per annum. Major manufactured exports include medical products, clothing, galvanized plates and sheets, paper pulp, cardboard products, and plastics. Tourism is the third largest generater of foreign exchange.

The United States, the Central American Common Market, the European Economic Community (principally West Germany), and Panama purchase a large portion of Costa Rican products. In mid-1986, the United States bought 41% of all Costa Rican exports, while the EEC and the CACM accounted for 25% and 12%, respectively.

Investors are attempting to introduce new non-traditional agricultural exports. Such products include ornamental plants, macadamia nuts, hearts of palms, melons, aquaculture products, cardomon, spices, and orange concentrate. If producers can penetrate international markets, the government is hopeful that in the medium- to long-term these products can diversify the export base.

Importation is on the decline. Stabilization programs prescribe the promotion of exports and the reduction of imports to adjust the current account deficit. The devaluation of the colón, the dollar shortage, and the augmentation of oil prices also discourage both private and public sector imports. However, Costa Rican industries depend on imports for production and are compelled to purchase such inputs as petroleum, spare parts, machinery, and other items regardless of terms of trade or price. Industrial imports generally account for almost 70% of all foreign purchases.

Most of Costa Rica's exports are provided by the United States (37%), the EEC (18%), and the CACM (8%).

International Financial Relations:

EXTERNAL DEBT (in millons)	
1985 Total	4,191
Public & Publically Guaranteed Long-Term	3,665
Private Non-Guaranteed Long-Term	297
Short-Term	40
IMF Credit	189
Long-Term Debt Service as a % of Exports	39.8
1970 Total (Long-Term Only)	246

* *

Even before the 1982 Mexican debt crisis shook the foundations of the international financial world, the bottom fell out for Costa Rica. Years of public spending based on infusions of foreign loans and a number of interrelated problems precipitated the 1981 crisis. Because the Costa Rican economy remained dependent on a few agricultural exports, events such as the worldwide drop in coffee prices caused serious difficulties. Higher oil prices and inflation, as well as rising interest rates, aggravated the situation.

Since 1981, the agro-export sector has stagnated and industry has remained dependent on costly imports and inefficient, undercapacity production runs. Foreign loans have fueled what little growth has

occurred. By the time the government announced in 1981 that it could not repay its debts because the nation was bankrupt, Costa Rica had accrued one of the highest debts per capita in the world. Debt payments amounted to $550 million in 1985 obligating approximately 40% of all export earnings to debt servicing. Costa Rica solicited the assistance of the international financial community in the early 1980s and has been hostage to the dictates of foreign economic "advice" ever since.

Ticos wryly claim that "Mr. Fondo," referring to the International Monetary Fund (IMF), runs their country. An austerity plan imposed by the IMF, has been in place since soon after the precipitation of the 1981 crisis. The program is typical of IMF prescriptions for indebted developing nations: (1) reduce the public sector deficit; (2) encourage exportation and open trade; and (3) promote foreign direct investment.

Austerity has meant wage controls, higher taxes, increasing unemployment in both the public and private sectors, the end of food subsidies, and higher utility costs. Also, the public sector has drastically cut health, education, and social service budgets.

Consequently, Costa Ricans have seen a large increase in families below the poverty line: in 1980, 40% were considered poor but by 1983 70% were classified as poverty-stricken. Yet the Ticos are fighting back.

A national protest against a proposed hike in electricity rates forced the government to reduce the increase.

Strikes have been organized by the stronger unions, particularly banana workers, government officials, teachers, and doctors. And, the peasants are fighting harder for rural land that has not been distributed fast enough. In 1984, campesinos occupied

the Limón offices of the National Agrarian Institute (IDA) and demanded governmental distribution of the country's idle land and under utilized latifundios, or large land-holdings.

1.20 Communications

LITERACY 1	DAILY GENERAL NEWSPAPERS 2		NON-DAILY GENERAL INTERST NEWSPAPERS AND OTHER PERIODICALS 3			
			Newspapers		Other Periodicals	
% of literate popula-	#	est. circ. /100	#	est. circ. /100	#	est. circ. /100
93.6	5	7.7	4	N/A	274	7.0

TV CHANNELS 4	RADIO STATIONS	RADIO & TELEVISION RECEIVERS 5				TELEPHONES 6	
		# Receivers (000)		# Receivers /100			
#	#	Radio	TV	Radio	TV	#	Average
7	50	205	181	8.6	7.6	281,040	1 for 8.5 people

1 UNESCO Yearbook 1985. Based on age group of 15+ years.
2 Ibid. 1982 Data
3 Ibid. All non-daily newspapers are issued between 1-3 times/week
4 Europa Yearbook 1985, p.801. Includes Channels 2,4,6,7,9,11, and Red Nacional de TV.
5 Ibid. 1983 Data
6 Britannica World Data. 1983 Data, p. 658.

* *

General: Costa Rica has developed one of the most sophisticated communications networks in Central America. The majority of the national media are produced, distributed, or transmitted from San José. Virtually all of the national newspapers and television programming and most periodicals are disseminated from Costa Rica's capital city. However, only one-third of Costa Rica's radio stations transmit from San José.

Newspapers:

For many reasons, concentration of daily newspapers per capita varies according to region. While there is one daily for every eight people in the Meseta Central, there is only one for every 100 people living in the tropical lowlands. Even in the highland region, the high cost of daily papers prohibits regular reading by most citizens. Nevertheless, the print media are the most valuable sources of news and commentary.

The nation's major dailies include La Nación, La República, and La Prensa Libre. The Tico Times and the San José News constitute the nation's two English language papers.

Radio:

The rural population and the urban poor often rely on radio as the primary source of information and entertainment. Many radio stations carry regular newscasts reaching lower and middle class groups of both urban and rural areas.

Only six of the existing radio stations are government-owned and a few are property of the Catholic Church. One station transmits programming in English. Faro del Caribe --call letters TIFC--is a non-commercial station that broadcasts religious and cultural programs in English and Spanish from San José. And, Radio Costa Rica transmits Voice of America news bulletins (in Spanish).

Because the northern third of the country depends on radio and televsion programs transmitted from Nicaragua, the government of Costa Rica has become concerned about the potential impact of the increasingly Marxist and propagandistic programming on their northern citizens.

Circumventing a Costa Rican law prohibiting foreigners from owning radio facilities, the Association for Information and Culture constructed and began operations of a Voice of America repeater station in Villa Quesada, Alajuela Province, in January 1985.

Television:

Television has an extremely large reach in the urban areas: more than 90% of the homes in San José and the provincial cities own a television set.

Of the seven commercial television stations, one--Red Nacional de TV--is government controlled. Costa Rican law requires television broadcasts to consist of at least 20% domestically produced programming.

Nevertheless, almost three-quarters of all television programs are imported, principally from the United States and Mexico.

Press Associations & Organizations:

No national news agency exists in Costa Rica although the Costa Rican media contribute to the regional Central American News Agency (ACAN-EFE). In 1982, plans were formulated by the Monge administration to develop such an organ. The government proposed that the agency be an essentially mixed enterprise with shareholders consisting of domestic radio, television and newspaper companies, government communication agencies, and employees of the agency. Purportedly, the agency would supply reliable, daily coverage of events specific to Costa Rica, particularly in remote areas that have historically received less coverage. To date, the proposed agency has not been developed.

Costa Rica receives almost all of its foreign news coverage from international news services, particularly Associated Press (AP). Foreign reporters, photographers, and stringers sent on assignment to Central America have found San José a safe haven from the turmoil. As a result, the following news agencies are represented in Costa Rica:

Foreign News Bureaus and Representatives

° ACAN-EFE (Central America)
° Agencia EFE (Spain)
° APN - Agentstvo Pechati Novosti (USSR)
° ANSA - Agenzia Nazionale Stampa Associata (Italy)
° AP - Associated Press (USA)
° dpa - Deutsche Presse-Agentur (FRG)
° IPS - Inter Press Service (Italy)
° Prensa Latina (Cuba)
* ° Reuters (UK)
° TASS - Telegrafnoye Agentstvo Sovietskogo Soyuza (USSR)
° UPI - United Press International (USA)
° Xinhua - New China News Agency (PRC)

* No official bureau, but a representative is based within the country.

Although a relatively free system of reporting the news exists, the government has influenced the makeup of the press corps through its Guild of Journalists Law of 1969. This law requires that all journalists practicing for the domestic media be graduates of the School of Journalists at the government-owned University of Costa Rica (UCR). Serving as the UCR-affiliated association that licenses Costa Rican journalists--thus registering them with the government--is the Colegio de Periodistas de Costa Rica. The Sindicato Nacional de Periodistas is an alternate professional organization, but it does not have the power to license practitioners.

Telephones:

The Instituto Costarricense de Electricidad (ICE) manages the automatic telephone system that reaches all regions of the nation. As of 1983, there were 281,040 telephones in use averaging one for every 8.5 people. Telephone access is limited in rural and outlying areas.

1.21 Transportation

Roads:

Since the rapid development of highways, motor transportation has become Costa Rica's primary mode of moving people and cargo throughout the country. There was a 20,575 km road system in 1970; government development programs increased the roadage to 35,684 km by 1986.

There are three types of road systems: the National grid; the Regional grid; and a system of Unclassified roads. The Inter-American Highway, running from the Nicaraguan to the Panamanian borders through the central highlands, is the foundation of the national system from which major regional roads branch. The Ministry of Public Works and Transportation (MOPT) fully administers the National grid of roads while it assists local governments in the development and maintenance of the Regional grid. The third system, the Unclassified grid consisting of 19,000 km of roads, is maintained by neither national nor local governments.

Roads connecting the major towns and cities are paved, all-weather roads. Often travelers must pass through San José to reach other cities.

Annually, flooding and landslides caused by inundating rains destroy sections of Costa Rica's roads. Dirt roads are often inaccessible, particularly in the northern and Caribbean coastal areas, due to the lengthy rainy season. MOPT has an adequate supply of construction and maintenance equipment distributed around the country for emergencies.

Railroads:

Although diminished in importance since the development of good road systems, the railroad still plays a crucial role in the movement of internationally traded goods. It has proved culturally crucial in uniting the Caribbean coastal population with the Meseta Central.

Ferrocarril del Norte and Ferrocarril del Sur, property of the Costa Rican subsidiary of United Brands, are two private railroads that provide limited public service. The Costa Rican Railroads (FECOSA), a division of the autonomous Costa Rican Development Corporation (CODESA), operates two government-run railways. The National Atlantic Railroad (FNA) principally services the Meseta Central to Puerto Limón. The Pacific Electric Railroad (FEP) connects San José with Puntarenas.

A majority of Costa Rica's 1,286 km of lines are plantation tracks owned and operated by private banana companies. While FEP has run electric trains since 1930, FECOSA anticipates the electrification of the entire FNA system in the near future.

Ports:

The two major port facilities in Costa Rica have been upgraded and expanded during the mid-1980s. Ports Limón and Moín serving the Altantic region now act as one facility under the administration of the autonomous JAPDEVA, or the Council of Port Administration and Economic Development of the Atlantic Shelf. The development of Puerto Calderas as an extension of Puntarenas port has been managed by the autonomous INCOP--the Costa Rican Institute of Pacific Ports.

A number of smaller, more specialized ports exist. Golfito and Puerto Quepos on the Pacific coast serve banana exports while tiny Puerto Morales is controled by sugar interests. Puerto Moín, while considered part of Limón, receives oil shipments and to an extent is also administered by the Costa Rican Petroleum Refinery (RECOPE).

Inland Waterways:

The population of Costa Rica's northern and Caribbean coastal regions has long relied on the extensive river system as a means of communication and transportation. The opening of the Tortuguero Waterway, a canal that cuts through lagoons and rivers from Puerto Moín to the Nicaraguan border and parallels the Atlantic shore, has greatly facilitated transportation along the

littoral as well as opened the northeast for settlement and agricultural activity. In contrast to air and railroad traffic, waterway use on the east coast has actually increased over the past 15 years.

Navigable rivers in the north and east include: the San Juan, San Carlos, Sarapiquí, Frío, Colorado, Tortuguero, and Sixaolo rivers. The Tempisque, Grande de Terraba, Bebadero, Sierpe, Coto Colorado, and Bolsón rivers on the Pacific side of the cordilleras can be navigated for limited distances.

Airports:

While air travel used to be an important link between the Meseta Central and provincial towns and cities, its role has diminished due to increased road travel. The nation's three major airports include JUAN SANTAMARIA INTERNATIONAL in San José, Puerto Limón's LIMÓN INTERNATIONAL, and TOMÁS GUARDIA INTERNATIONAL located in Liberia, Guanacaste Province. In addition, 16 other airports have hard surface runways of at least 4,800 km. These smaller airports service Cabo Velas, La Flor, Los Chiles, Chacarita, Quepos Managua, Nuevo Palmar Sur, Golfito, Coto 63, Coto 47, San Vito de Java, Buenos Aires, Río Frío, San Pedro, Guápiles. and Pandora.

Costa Rica's national airline, Lineas Aereas Costarricenses (LACSA), offers international flights while government-owned Servicios Aereas Nacionales (SANSA) flies domestically. Twenty-seven international airlines--including U.S. carriers Eastern, Pan Am, and TWA--service Costa Rica with either direct or connecting flights.

1.22 Electric Supply:

As in the United States, Costa Rican electric supply is 110-120VAC, 60 Hz, single phase. And, 220-240VAC, single phase, is available for larger appliances. Transformers are not needed when using most U.S.-made electric products.


NICARAGUA
San Carlos
La Cruz
San Juan del Norte
ALAJUELA
HEREDIA
Liberia
GUANACASTE
Arenal
Pital
Puerto Viejo
Villa Quesada
Santa Cruz
Nicoya
Puerto Jesús
Guácimo
Grecia
Siquirres
Matina
Limón
Barranca
Alajuela
Heredia
Puntarenas
Turrialba
Liverpool
SAN JOSÉ
Santiago
San Ignacio
Cartago
PUNTARENAS
CARTAGO
LIMÓN
San Marcos
Atalanta
Suretka
Sixaola
SAN JOSÉ
Puerto Quepos
San Isidro
Dominical
PANAMA
Palmar Sur
PUNTARENAS
San Vito
Golfito
Corredor
La Concepción
Puerto Jiménez
Puerto Armuelles
COSTA RICA
ISLA DE COCO

2. Disaster Vulnerability

2.1 Overview of the Physical Environment

Costa Rica can be divided into three geographically diverse regions -- the Interior cordilleras, the Caribbean lowlands, and the Pacific littoral.

Interior Cordilleras - The republic's most notable topographical feature is its rocky central region. A series of mountain ranges, or cordilleras, traverses the country running northwest to southeast. The four major interconnecting chains include:

(1) CORDILLERA DE GUANACASTE: the northernmost range dotted with volcanic massifs

(2) CORDILLERA DE TILARÁN: separated from the Guanacaste chain by Laguna de Arenal

(3) CORDILLERA CENTRAL: includes the densely populated Valle Central and four volcanic massifs (often referred to as the volcanic chain or the Cordillera Volcanica Central)

(4) CORDILLERA DE TALAMANCA: begins at the southern rim of the Valle Central and extends southeast to the Panamanian border

Five historically active volcanoes are interspersed throughout the northern Cordillera de Guanacaste. There are five more volcanoes located in the Cordillera Central, where most of the population is located. Two of these--Volcán Irazú and Volcán Poás--are active. Volcanic activity is one of the leading causes of death, displacement, and economic disruption in the country. (Refer to section 2.4 for more detailed information.)

Two major upland basin areas formed by the central and southern chains are the Valle Central and the Valle del General. The Valle Central is home to the nation's capital, San José, as well as the provincial capitals of Cartago, Heredia, and Alajuela. This valley is the most densely populated region in Costa Rica. It actually consists of two sub-basins, the San José and the Cartago valleys which are separated by low volcanic hills. Often the Valle Central is incorrectly referred to as the Meseta Central, a region that includes most but not all of the valley in addition to northern lands beyond the Valle Central. The second basin, Valle del General, is situated on the western side of the Cordillera de Talamanca. It is approximately the same size as the Valle Central but its floor lies at a lower elevation.

The Caribbean Lowlands - The lowlands comprise approximately one-fifth of the area of Costa Rica and extend from the foothills of the Cordillera de Guanacaste to the Caribbean Sea. The area is laced with a series of rivers, from Río San Juan in the north and to Río Sixaola in

the south. They occur every 10 to 30 km. Fresh water swamps are common. Until the Tortuguero Waterway was opened, few cities were constructed in this area. Puerto Limón is the only natural port on the Caribbean coast and site of the largest eastern settlement.

The Pacific Littoral - Rocky headlands interspersed with short, narrow beaches form Costa Rica's expansive Pacific shoreline. Alluvial inland plains stretch from Osa Peninsula to the port of Puntarenas. Four peninsulas--Santa Elena, Nicoya, Osa, and Burica, in descending order--jut into the Pacific waters. With the mainland shore, the Nicoya and Osa peninsulas surround the Golfo de Nicoya and Golfo Dulce, respectively. The Río Tempisque valley, situated between the mainland and Peninsula de Nicoya, is a low, smooth plain with scattered steep slopes and cliffs. The Nicoya and Osa peninsulas are characteristically hilly with small plains. They are sparsely populated.

When first discovered, all of Costa Rica was covered with dense forest with the exception of isolated, drier areas in Guanacaste Province. The introduction of banana production in the 1800s initiated large-scale land clearing. By 1940, 25% of the forested area had been cleared and by the early 1980s only 33% of the original land remained covered by forests. The Pan-American Highway has opened the western regions for deforestation. Large areas have since been cleared in Alajuela, Guanacaste, and Puntarenas provinces. Guanacaste Province is almost completely void of forests. There has been little attempt until recently to implement a large-scale replanting scheme. Nevertheless, recent governmental conservationist efforts have included the designation of certain forest areas as protected reserves and the incorporation of additional hectares in national parks. Deforestation and environmental degradation are becoming serious problems that aggravate flooding and landslides. For more information on the state of deforestation, refer to section 2.6.

Lakes, Rivers, and Oceanic Bodies

Originating in the mountainous highlands, numerous rivers snake through the country toward the two coasts and a large, freshwater lake, Lago de Nicaragua, which is located just north of the Nicaraguan border. The Pacific shore forms four major bays and gulfs. Finally, two small northern lakes are fed by major rivers.

All rivers start in the cordillera ranges, flow toward lower elevations, and directly or indirectly empty into the Pacific Ocean or Caribbean Sea. Río Frío, the sole exception, flows into Lago de Nicaragua and feeds Laguna de Caño Negro, a tiny lake in the north-central part of the country. The larger Laguna de Arenal separates the Guanacaste and Tilarán mountain chains and is the source of Río San Carlos, which runs into Río San Juan.

Flowing from Lago de Nicaragua and forming the northeastern border, the Río San Juan drains the northernmost sector of the Caribbean lowlands. (This river has been the site of numerous border clashes between the Nicaraguan contrarevolucionarios--contras--and the Sandinistas, and on occasion between the Ticos and the Nicaraguans). The Río San Juan and the Río Colorado, its tributary, form one of only two regions that have extensive flood plains or deltas. The second lies at the mouth of the Río Sixaola which forms a small section of the southeastern border with Panama.

The remaining rivers that run through the lowlands are much too small to form extensive deltas. The Caribbean coastal plains host vast freshwater swamps that are particularly characteristic of regions north of Limón and travel inward along many of the eastern rivers. Through these swamps, the Tortuguera canal was constructed. It runs parallel to the Caribbean shore and facilitates the transport of cargo to and from newly emerging communities along the northern Caribbean coast.

Rivers flowing to the Pacific are generally fewer, shorter, and more precipitous than those running toward the Caribbean. They are more frequent along the northern coast and Guanacaste Province. Major Pacific rivers include the Río Tempisque which feeds the Nicoya Gulf, the Río Grande de Tárcoles which drains the San José basin and empties south of Puntarenas, and the Río General and the Río Grande de Térraba which carry water from the Valle del General. Swamps predominate around the mouths of the Río Tempisque and the Río Grande de Térraba.

Due to consistent rainfall on the lowlands, rivers that empty into the Caribbean flow at a fairly constant volume and rate all year. Dry seasons, however, impact the westward-flowing rivers. When the rains diminish in frequency, these rivers tend to dry up or decrease in volume. This has been an important consideration to the government when deciding to construct hydroelectric plants on the west coast. There are regional exceptions where the dry seasons are short and the rivers are relatively unaffected. Most notable is the southern section of Puntarenas Province where rains have produced lush rain forests.

The irregular Pacific coast forms the Papagayo Gulf, Nicoya Gulf, Coronado Bay, and Dulce Gulf. The Nicoya and Dulce gulfs are deep and are almost entirely surrounded by land.

Climate

Although Costa Rica lies within the tropical latitudinal zone, its regional climates vary and depend upon elevation and prevailing off-shore winds. A 1,000-m rise in elevation is accompanied by a decrease in mean temperature of approximately 5°C. Thereby Esparta, only 208 m above sea level, has an annual mean temperature of 26.5°C while Sanatorio Duran at 2,337 m above sea level averages 14.7°C yearly. Mean annual temperatures can be affected by the duration and intensity of the rainy season which varies among regions.

Several authorities label Costa Rica as "perhaps the wettest country in the world." National average rainfall is 3,300 mm per year. However, Costa Rica's rugged topography and the differences between Pacific and Atlantic air masses cause rainfall to be distributed unevenly throughout the republic.

Northeasterly winds increase rainfall over the Caribbean lowlands and the eastern slopes of the cordilleras. The result is that these regions experience lower temperatures than the Pacific coast and highland areas protected from these winds. Pacific regions, including the Golfo Dulce area where the hills are low and cannot stop the winds, suffer the same weather patterns as the lowlands.

Rainy seasons range from six months (May to October in northeastern Guanacaste) to all year (particularly the northeast and the Caribbean littoral). The interior cordilleras cause rain to condense and fall on the Caribbean lowlands most, if not all, of the year. Southwesterly gusts are responsible for May to October rains along the Pacific coast and in the western mountains. The mountains again cause rain to fall most heavily and for a longer duration (nine months) in the southwestern pocket of Puntarenas Province.

The following lists several of Costa Rica's principal cities and the time/duration of their rainy season:

RAINY SEASON THROUGHOUT COSTA RICA

City	Province	Duration	# of Months
Limón	Limón	All Year	12
Golfito	Puntarenas	April-December	9
Turrialba	Cartago	May-January	
San Isidro	San José	May-December	8
Puerto Quepos	Puntarenas		
Tilarán	Guanacaste		
San José	San José	May-November	7
El Coco, Alajuela	Alajuela		
Esparta	Puntarenas		
Nicoya	Guanacaste		
Liberia	Guanacaste	May-October	6
Las Cañas	Guanacaste		

With Costa Rica's diverse geography and high levels of rainfall, the nation is susceptible to a variety of natural disasters. The most frequently occurring include floods, avalanches, and landslides which are often triggered by torrential rains. Other natural and man-made disasters endemic to Costa Rica include earthquakes, volcanic eruptions, deforestation, and environmental degradation. The following sections discuss Costa Rica's vulnerability to certain disaster types.

2.2 Disaster History

Date	Disaster Type	Location	# Killed	# Affected	# Homeless	Damage ($000)
03-18-63	Volcanic Eruption	Meseta Central	15	5,000	5,000	n.a.
			Comments: 200 Injured. Erupt./ Floods/Slides			
07-29-68	Volcanic Eruption	Mt. Arenal, North	87	12,391	3,280	5,000
10-69	Flooding	Meseta Central (11-69), Pacific Coast (10-69), & Limón (10-70)	7	4,580	0	4,000
			Comments: 23 Injured, 3 Floods			
04-09-70	Flooding	Limón & Cartago Provinces	23	10,000	0	6,000
			Comments: 40 Injured			
12-04-70	Flooding	Estrella Valley	1	5,200	0	24,000
04-14-73	Earthquake	S. of Laguna Arenal	21	3,563	84	200
			Comments: 98 Injured			
1973	Drought	Laguna	0	0	0	n.a.
06-75	Volcanic Eruption	Mt. Arenal	2	0	0	n.a.
04-76	Forest Fire	Chirripo Mountain	0	0	0	n.a.
10-21-76	Volcanic Eruption	Mt. Arenal	0	70,000	0	n.a.
12-14-80	Flooding	East Coast	1	1,350	0	n.a.
04-02-83	Earthquake	SE of San José (100 m)	1	475	475	n.a.
			Comments: 200 Injured			
07-03-83	Landslides (due to Earthquake)	San José Province	1	5,000	0	n.a.
02-29-84	Warehouse Fire	San José	0	0	0	2,500
T O T A L S			159	117,559	8,839	41,700

Source: OFDA Disaster History on file at the Office of U.S. Foreign Disaster Assistance in Washington, DC. Covers 1900 to the present.

2.3. Earthquakes

Historically, volcanoes--particularly Irazú and Poás--have been unjustly blamed for seismic incidents in Costa Rica. Seismic activity results from the movement of two mobile crustal plates. Friction of the tectonic plates releases energy which manifests itself in earthquakes of differing intensities. Costa Rica lies at the juncture of the western Cocos and the eastern Caribbean plates. The Caribbean-Cocos boundary is one of the more active seismic regions in the world. Based on the high rate of slippage of these plates, the country has a very significant, long-term potential for earthquakes.

Costa Rica is susceptible to large subduction quakes as well as shallow, but very hazardous, plate-edge type temblors. With the population heavily concentrated in the Valle Central, even a small, shallow temblor could cost many lives and devastate the economy by destroying crucial infrastructure and industry concentrated in the cities. For example, water and power supplies that service the Valle Cental are particularly vulnerable to seismic occurrences. Only a few major aqueducts provide water for the population centers and these cross fault lines. A strong earthquake could cut power and water to San José, Cartago, Alajuela, Heredia, and other densely settled regions.

Seismic, specifically earthquake, activity has resulted in much destruction over the years. The colonial capital of Cartago has been most affected by earthquakes. Two temblors razed the city in September 1841 and again in May 1910 while an April 1910 quake seriously damaged Cartago. Among the most destructive earthquakes in Costa Rica's recent history was the March 1924 temblor that devastated San Casimiro and violently shook the Valle Central. The epicenter of the quake encompassed the towns of Orotina, San Mateo, and San Ramón. The consequences of this episode would have been much more catastrophic had the towns been as heavily populated then as they are today.

Since 1950, the most destructive quakes occurred in:

- 1952 - devastated Patillos
- 1955 - affected Bajos de Toro Amarillo
- 1973 - struck the outskirts of Rio Chiquito de Arenal
- 1983 - shook the entire nation in April (The intensity of this quake was stronger than the one that two days before caused serious destruction in Popayan, Colombia.)
- 1983 - hit San Isidro del General in July causing landslides that cut off several small towns from the larger urban areas and destroyed sections of the Pan American Highway. (Since all major roads lead to San José, a disruption of any-- particularly the Pan-American Highway--is devastating.)

SEISMICITY OF COSTA RICA
1638 to 1983

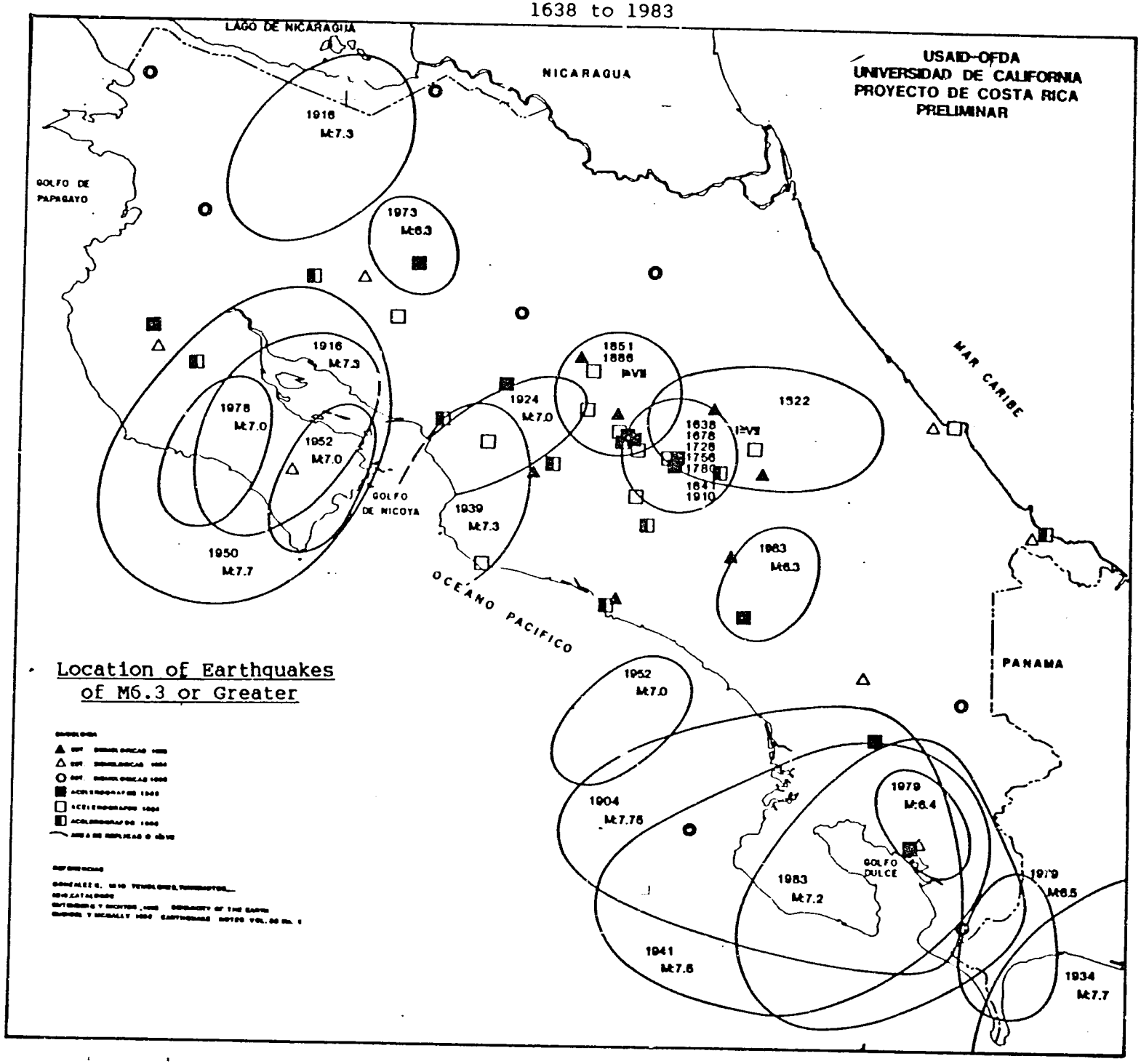


Figure 2.a.

The most recent activity of the tectonic plates resulted in three consecutive temblors of less than Richter 5 on July 16, 1987. The epicenters for all three were located close to Puerto Quepos with the shocks felt throughout the entire nation. While no one was killed, a few homes and buildings suffered cracks in their walls and floors. The quake also broke glass windows and caused electrical lines to fall disrupting service to many rural cantons. The Red Cross had alerted all personnel and the amateur radio club maintained service all night in anticipation of damage and victims.

Figure 2.a. illustrates the locations of several earthquake epicenters and aftershock zones that affected Costa Rica between 1638 and 1983. Those demarcated were greater than or equal to 6.0 on the Mercali scale. For a history of pre-1925 earthquake and volcanic activity, see Appendix IV.

2.4 Volcanicity

Costa Rica's volcanic mountain chains owe their existence to the movement of the Cocos/Caribbean tectonic boundary. Seven historically active volcanoes exist within the cordilleras of Guanacaste and Central. They include Orosi, Ricón de la Vieja, and Arenal in the Guanacaste mountain chain and Poás, Barba, Irazú, and Turrialba in the Cordillera Central, which is often referred to as the Cordillera Volcanica Central. Table 2.b provides the chronology of volcanic activity in Costa Rica. Both Poás and Irazú have remained active for hundreds of years.

Volcanoes Miravelles (2,028 m), Tenorio (1,916 m), and Platanar (2,240 m) have not been been active for centuries. However, the status of Volcán Tenorio is uncertain, and Miravelles and Platanar are classified as fumarolic or steaming with measurable subsurface temperatures. Figure 2.c. indicates the approximate location of the ten volcanoes. Figure 2.d. shows the flow patterns and areas potentially vulnerable to eruptions of volcanoes Arenal, Poás, and Irazú.

Unlike earthquake incidents which inflict immediate destruction, the effects of a volcanic eruption can be seen for years after the occurrence. The eruption of Volcán Irazú from March 1963 until 1965 seriously affected the Costa Rican economy. The enormous ash eruptions not only adversely affected agricultural production throughout the country for several years, but ash accumulation in the Rio Reventazón caused significant flooding, caved-in a natural dam produced through previous accumulations of ash, filled the river with an enormous quantity of mud and stones, and destroyed part of the town of Taras de Cartago.

After a long period of dormancy, Volcán Arenal erupted with force in 1968 and has had repeated episodes ever since. Serious side-effects resulting from volcanic activity are illustrated through Volcán Arenals 1968 explosion. Not only did this eruption produce lava, gas, and ash

CHRONOLOGICAL HISTORY OF VOLCANOES
OROSI, RICON DE LA VIEJA, ARENAL, POAS, BARBA, IRAZU, & TURRIALBA

Name	Elevation	Location (Cordillera)	Past Activity
OROSI	1,660 m	Guanacaste	05/1844
			1849
RINCON DE LA VIEJA	1,916 m	Guanacaste	1860
			1863
			09/1966 to 12/1967
			04/1969 to 05/1969
			09/1969 to 10/1969
			08/1970
ARENAL	1,640 m	Guanacaste	1525
			* 07/1968
			* 06/1975
			* 10/1976
			1980
POAS	2,704 m	Central	1834
			1838
			1880
			12/1907
			12/1910
			05/1914
			10/1914 to 03/1915
			11/1946
			09/1952 to 12/1957
			06/1961
			05/1963 & 07/1963
			12/1964 (2)
			01/1967
			05/1969 (2)
			02/1972 to 09/1973
			11/1974 & 02/1975
			06/1976 & 11/1976
			05/1977
			12/1977
			04/1978 to 05/1978
			09/1978 to 12/1978
			09/1979 to 01/1980
			09/1980
BARBA	2,920 m	Central	03/1967
IRAZU	3,490 m	Central	02/1723 to 12/1723
			05/1726
			1821
			05/1822
			1826
			1842
			05/1844
			03/1847
			1870
			1882
			09/1917 to 05/1921
			03/1924
			02/1928 to 05/1928
			10/1930
			03/1933 to 07/1933
			06/1939 to 1940
			03/1963 to 02/1965
			08/1967
			03/1974
TURRIALBA	3,335 m	Central	1750 to 1850
			09/1864
			02/1866 to 03/1866

Source: Volcanoes of the World and the Office of U.S. Foreign Disaster Assistance (OFDA) computer file.

Note: (2) means that two separate occurrances were recorded in the same month and year. An asterisk (*) signifies that OFDA responded to damage caused by these incidents.

Table 2.b.

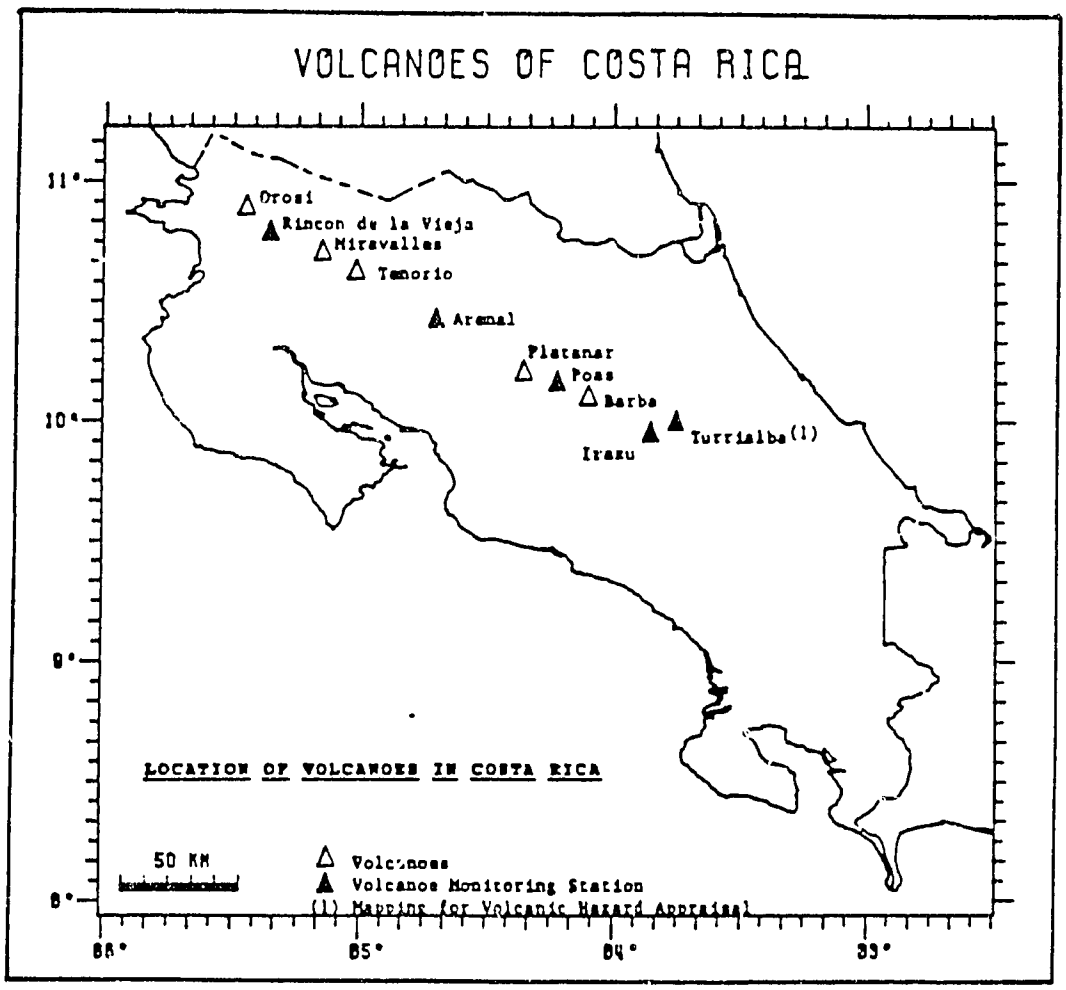
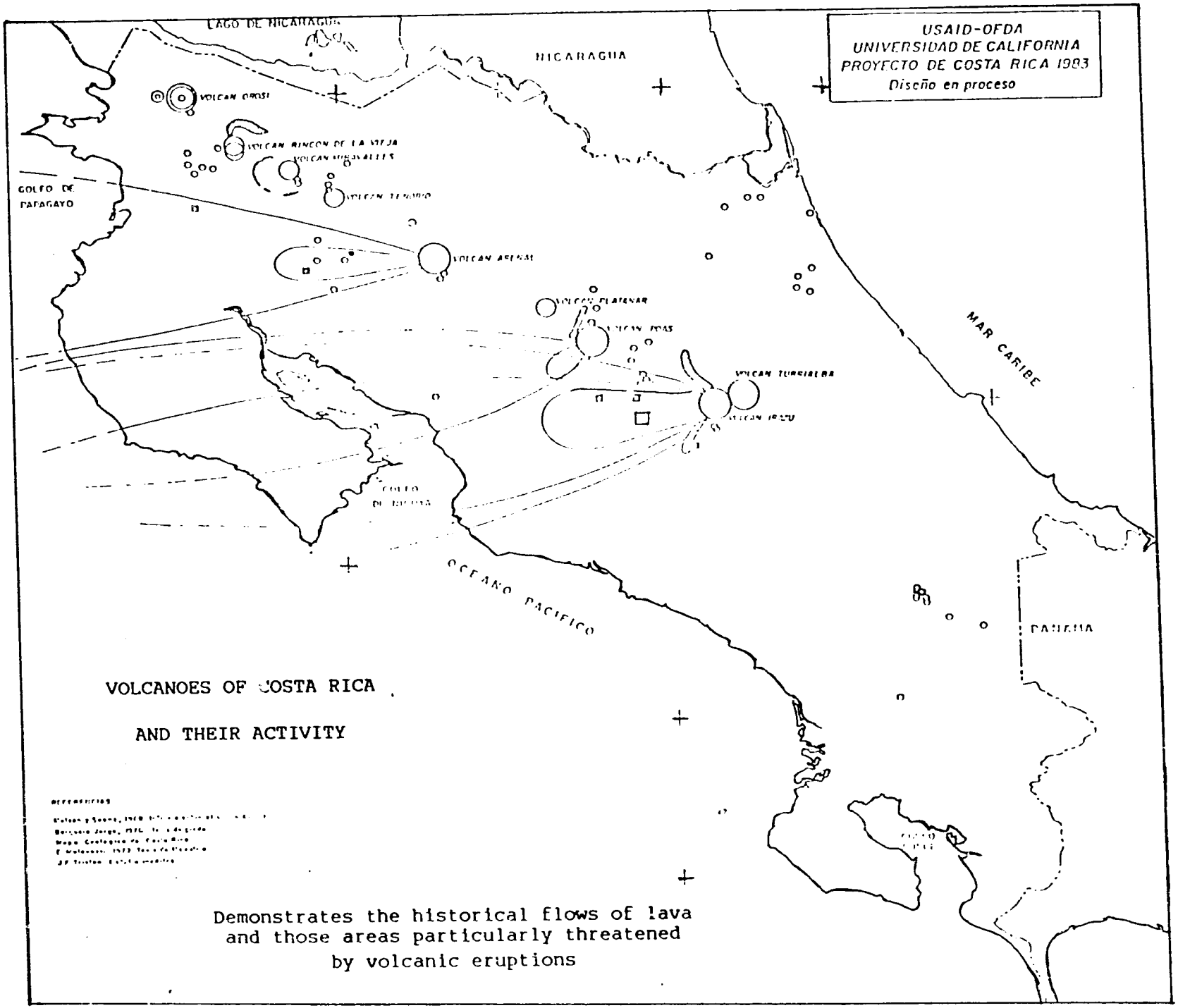

VOLCANOES OF COSTA RICA
Orosi
Rincon de la Vieja
Miravalles
Tenorio
Arenal
Platanar
Poas
Barba
Irazu
Turrialba (1)
11°
10°
9°
8°
85°
84°
83°
LOCATION OF VOLCANOES IN COSTA RICA
50 KM
Volcanoes
Volcanos Monitoring Station
(1) Mapping for Volcanic Hazard Appraisal

Figure 2.c.



Demonstrates the historical flows of lava and those areas particularly threatened by volcanic eruptions

Figure 2.d.

but it caused a heat wave of close to 800°C that destroyed everything in its patn and caused 70-100 deaths in its 7-km course. Renewed activity of Volcan Arenal occurred in June 1970 and August 1972 provoking small-scale seismic occurrences as well as gas and ash eruptions. The heat wave was repeated in 1974. In 1979 and 1980, the active crater remained obstructed by lava that had formed a dome over the crater. In May 1981 the crater opened and the dome deflated while gas escaped with force through the central shaft. Later, the volcano ejected fast flowing lava and produced explosions of lava and rocks. It is still threatening today.

Volcán Rincón de la Vieja has caused its share of destruction through recent times. During its period of greatest activity--from November 1966 until mid-1970--eruptions of ash burned pastures south of the volcano, killed wildlife, and contaminated rivers. Ground reverberations from the volcanic explosions were felt over large portions of Guanacaste and eastern Alajuela provinces. Finally, Volcán Poás is presently quite active and poses the greatest risk in the short term.

Despite the historic damage caused by volcanic activity, the government has proceeded to run roads through volcanic regions. Highways cross passes in the Cordillera de Guanacaste, located at relatively low elevations (300-500 m). The higher elevations (1500-2000 m) and rugged topography of the Cordillera Central have impeded road development making the transportation infrastructure that links the east coast to the highlands less vulnerable to damage by volcanic activity.

Volcanic soil is very rich in nutrients and attracts agricultural activity. The government of Costa Rica has attempted to restrict settlement near volcanoes that pose life-threatening risks by claiming the land as government property. Volcanoes Irazú, Poás, and Rincón de la Vieja are national parks that encompass 2,400 ha, 4,000 ha, and 11,700 ha, respectively.

2.5 Landslides

Landslides in Costa Rica are triggered by a number of events, usually volcanic activity, earthquakes, heavy rains, or a combination of all three. Progressive deforestation and development have increased the vulnerability of Costa Ricans--particularly those in the Meseta Central--and crucial infrastructure to hazardous landslides. Continual seismic activity, deforestation, and the development of road systems and other infrastructure make Cartago and San José particular targets for damage resulting from devastating landslides. Experts predict that there is enough loose land on the mountains surrounding Cartago to bury the entire city if a seismic event destabilized the area.

The July 3, 1983, earthquake that struck the San Isidro region caused numerous landslides along the Pan-American Highway. One landslide covered a 100 m stretch of the main road with debris piled 25 m high. Between 300 and 400 people were trapped due to impassable roads. Landslides triggered by an earthquake in Laguna de Arenal ten years earlier on April 13, 1973, killed 23. The landslides, not the earthquake, were responsible for the damage and loss of life. Extensive damage to roads caused by the falling debris resulted in the temporary isolation of some residents. Annual flooding that year was intensified due to sediment that settled in the Tronadora and Chiquito rivers.

Earthquakes trigger the overwhelming majority of landslides, particularly along road cuts which are often steeper than natural slopes. In the Laguna Arenal region, the Tronadora, Quebrada Grande, and Rio Chiquito areas are particularly at risk of road blockages and damage from debris slides and falls from road cuts. Despite impending disasters and high vulnerability to landslides, hazard mapping is insufficient.

2.6 Flooding and Drought

Flooding

Flooding is the most frequent disaster in Costa Rica and is the disaster-type affecting the most people. It is often accompanied by landslides which compound damage done to bridges, roads, other infrastructure, and private property. Flooding in the Metropolitan and surrounding regions is common between August and October. Occasionally, inundating rains and overflowing rivers can be a problem through November.

The increasing use of floodplains for economic activity and human settlement exacerbates the effects of annual flooding. Rapid urbanization over the past decade has not been countered by zoning laws intended to prohibit construction in high-risk areas. As a result, slums now proliferate on flood-prone banks of the Valle Central, and in Limón Province settlements are emerging on the numerous rivers that flood every year.

Through its study of flooding since 1969, the Costa Rican Office of Civil Defense has identified zones vulnerable to flooding. The hardest hit regions in terms of human costs include the Virilla, Tiribi, Torres, Maria Aguila, and Ocloro rivers located in the Valle Central. Many poor, particularly the new unregistered refugees and illegal aliens from Central America, have built their homes along the banks of these rivers and suffer tremendous losses when their homes and belongings are swept away or destroyed by swift and inundating waters.

The region most affected by flooding but with historically little damage has been the Caribbean lowlands at the base of the Cordillera Central. However, new roads have opened the territory for human use and exploitation. Increasing settlement in cities such as Pocora, Guácimo, Guápiles, and Puerto Viejo de Sarapiquí makes the region much more vulnerable to potentially devastating floods. The new infrastructure of many of these boomtowns is also vulnerable to destruction. Guanacaste Province, despite its relative short rainy season, is also highly vulnerable to periodic flooding.

Destruction of natural watersheds as a result of rapid and unregulated deforestation will increase the occurrence of flooding. The lack of political will to address this issue by instituting and enforcing flood-risk zoning only augments the possibilty of future devastation, particularly in the growing Caribbean lowland towns situated on outwash cones at the base of the Cordillera Central mountains.

Outside the Metropolitan region, overflowing rivers cause a variety of problems every three to four years. Bridges and railroads are often damaged. Areas can be left incommunicado as a result of destruction to transportation lines or communications equipment. On a few occasions, inundating rains have produced hurricanes which have affected maritime zones around the Caribbean. (Costa Rica, while not affected by hurricanes, is the point of origin of many storms that devastate the Caribbean basin.) Often resulting from torrential rains, landslides cause destructive debris flows and floods. Landslide debris that has settled in riverbeds has been known to actually change the course of certain rivers. Recent powerful course changes to the Toro Amarillo, Blanco, Costa Rica, and Chirripo rivers have resulted in severe flooding in communities along these rivers.

Drought

Droughts are rare in Costa Rica. While most areas of the country experience long rainy seasons, Guanacaste Province receives only six to seven months of rain versus the nine to 12 month average in other regions.

Guanacaste Province, which often experiences flooding during the rainy season, suffers a dry season from November to April that brings prolonged summers and water scarcity. One effect of the drought-like summers is the difficulty in producing electricity from hydroelectric plants in the northwest corner. The water level of Laguna de Arenal in Guanacaste dropped precariously during the dry season but a man-made diversion of Río de Arenal from its course to the Caribbean to its present Pacific Ocean course ensures that the lake is full enough in the dry season to support two hydroelectric plants as well as provide water to irrigate 105,000 ha of farmland in the area.

Droughts affecting the province of Guanacaste have caused destruction to agricultural and livestock production. Large losses of produce, particularly rice, have been recorded. The last serious drought which illicited minor international support occurred in 1973. Recent U.S.-GOCR well-digging projects in Guanacaste Province aim to alleviate recurring drought problems. The wells will provide water for livestock, irrigation, and human use.

2.7 Deforstation and Environmental Degradation

The link between environmental degradation and increased occurrences of natural disasters has been widely acknowledged. Environmental degradation threatens to indirectly increase the magnitude and impact of several disaster-types common to Costa Rica. Deforestation as a result of poor land use is a particular problem. Immediate and effective replanting and conservationist efforts are needed.

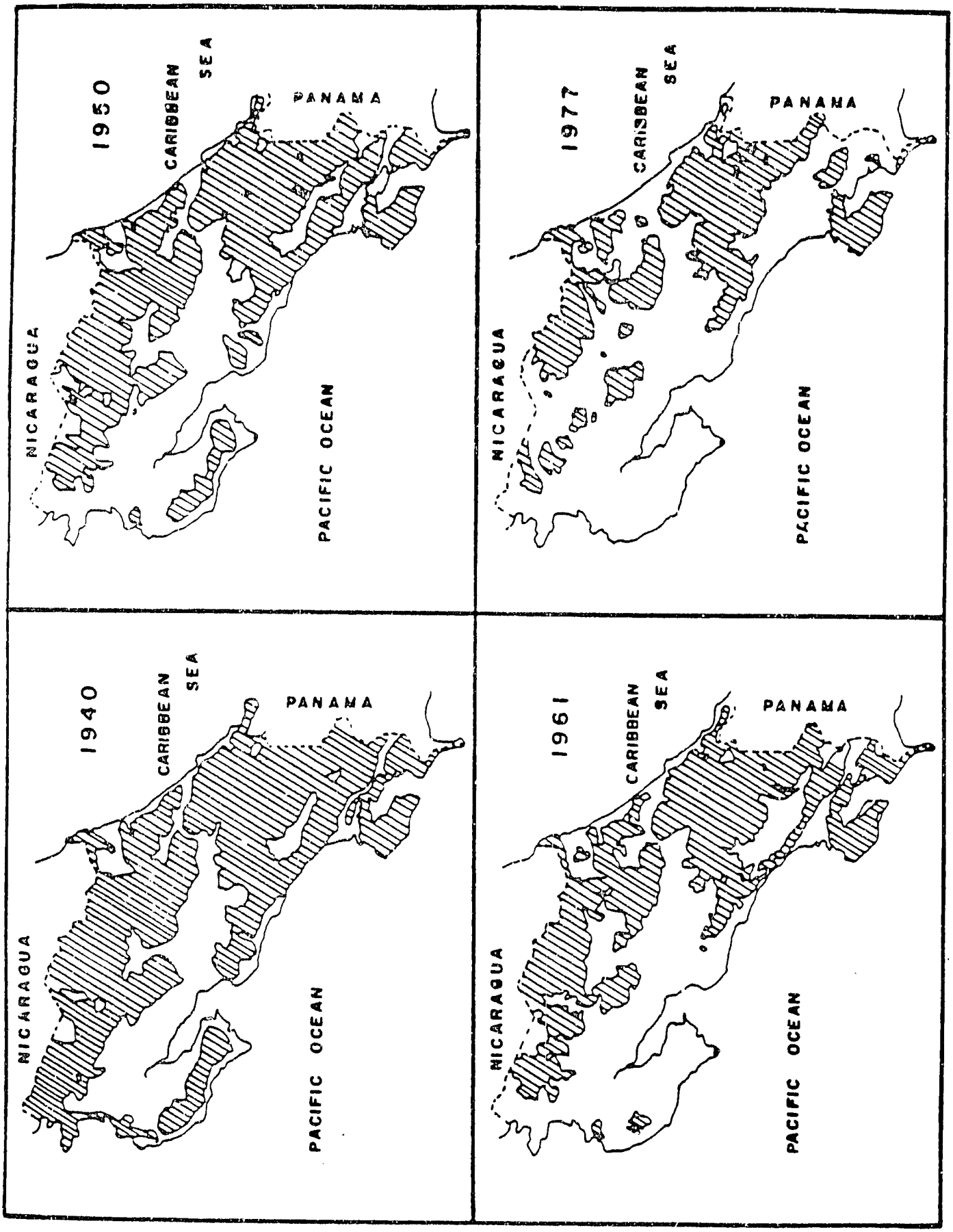
Approximately 99.8% of Costa Rica was covered by dense forest when discovered in the early 16th century. Only the drier, more isolated parts of Guanacaste Province were devoid of trees. Today, less than 30% of the original forests remains and this is being further depleted at a rate of 55,000 ha every year. The greatest period of destruction occurred over the past 27 years when 50% of the land was deforested. The following maps (2.e. & 2.f.) demarcate the forest remaining in 1977.

Deforestation causes the erosion of topsoil, falling river levels as well as flooding. Farmers often find themselves in a vicious cycle once the land is cleared. First, they plant annual crops such as corn and beans. Some go on to plant cacao and coffee for export. Soon the topsoil washes away and the land will no longer profitably support crops, so farmers then turn the plot to a pasture for livestock production. Unless the grazing land is carefully managed, weeds that the animals will not eat will proliferate and further marginalize the land. Eventually, the plot cannot be used even for livestock production. A USAID report released in 1979 advised that once land reaches this stage of degradation it is extremely difficult, if not impossible, to replant trees and replenish the soil. At present, large portions of the central and south Pacific slope have already reached the stage of severe marginalization.

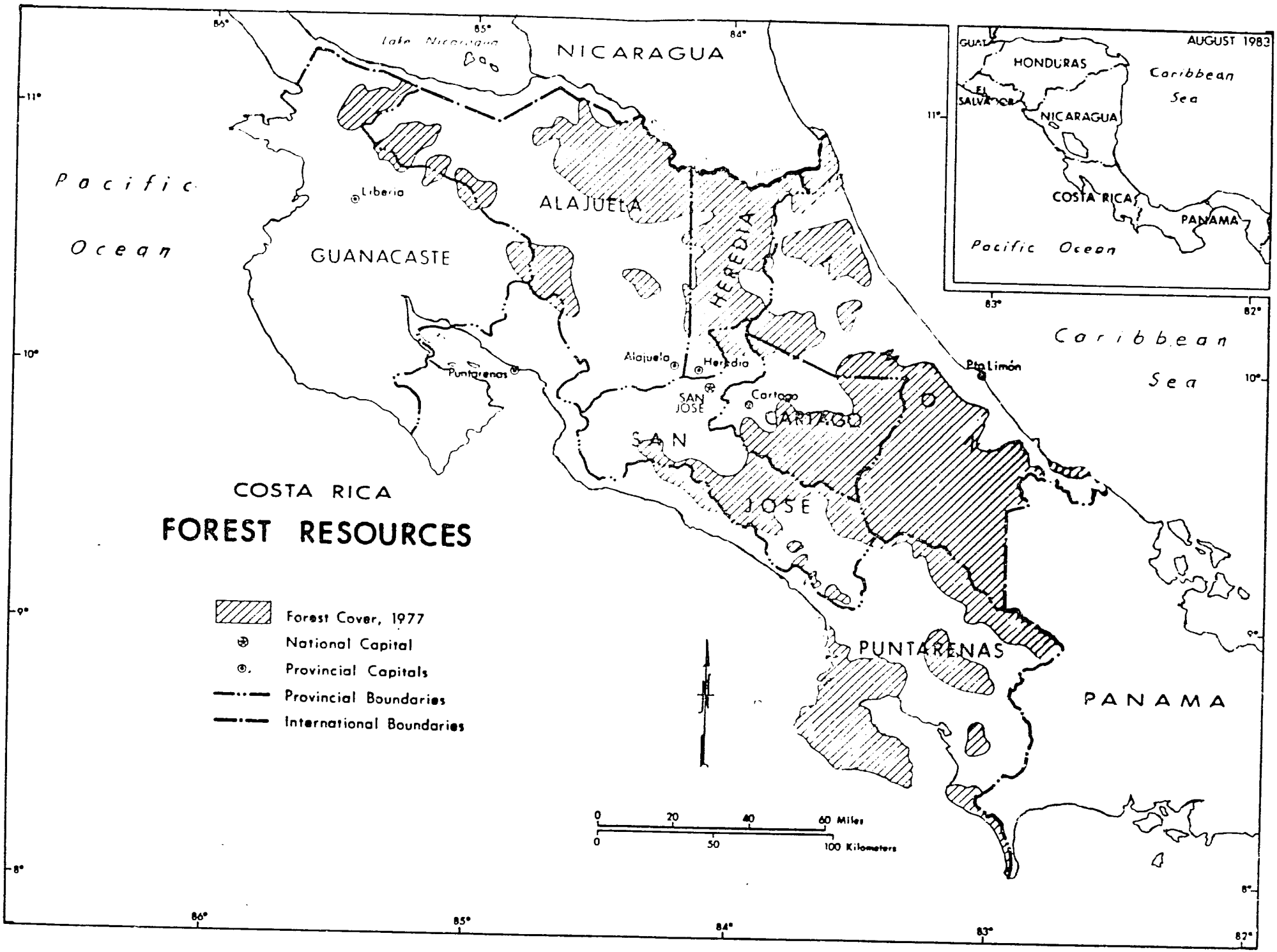
The case of deforestation of the Parrita watershed area south of San José demonstrates this cycle as well as the ecological effects of deforestation. This region at one time was the largest producer of corn and beans in the country. However, tropical rainstorms assaulting the unprotected ground increased erosion by washing fertile topsoil away. Rain no longer saturates the ground; it runs off and floods banana plantations downslope. Finally, landslides and washed-out roads are now common in the area.

THE LOSS OF COSTA RICA'S FOREST RESOURCES

1940 to 1970



Map 2.e.


COSTA RICA
FOREST RESOURCES
Forest Cover, 1977
National Capital
Provincial Capitals
Provincial Boundaries
International Boundaries
NICARAGUA
Lake Nicaragua
Pacific Ocean
Caribbean Sea
GUANACASTE
ALAJUELA
HEREDIA
CARTAGO
SAN JOSE
PUNTARENAS
PANAMA
Liberia
Puntarenas
Alajuela
Heredia
Cartago
Pto Limón
AUGUST 1983
HONDURAS
EL SALVADOR
COSTA RICA
0 20 40 60 Miles
0 50 100 Kilometers

Map 2.f.

Environmental degradation is not caused exclusively by the clearing of trees. Land is degraded by erosion losses, physical compaction, repeated burning, poor road design and construction, chemical toxification, inappropriate land use, and rapid urbanization which is co-opting the most productive agricultural lands in the Meseta Central. As silt from stripped hills and mountains settles in rivers it not only increases threats of flooding but make droughts more likely because less water is retained by the soil. It also frustrates the viability of hydroelectric, potable water, irrigation, and reforestation projects. In the early 1980s, 41% of the land was either severely or moderately eroded with the worst being Pacific lands which have a 60% rate of serious or moderate erosion.

At the present, 1,810,000 ha of Costa Rica's best land for forestry has been cleared and is being cultivated or used for livestock grazing. Reforestation programs have been attempted only recently. Yet several factors will continue to inhibit successful replanting schemes in the near future:

1) The Costa Rican Forest Service (DGF), a branch of the Ministry of Agriculture, lacks the manpower, technical expertise, and resources to mount a truly effective effort.

2) Land most suited for reforestation is in private hands and out of the jurisdiction of public programs.

3) It is difficult to find a suitable species to replant. The native tropical hardwoods are difficult to manage.

4) Replanting trees pays off only in the long run versus the short-term returns of crop production and husbandry.

5) National laws promote an attitude that land is more valuable when it is cleared and being used in agriculture or livestock production. Laws predominant until only 17 years ago entitled anyone to land not actively being used if they occupied and "improved" that parcel. "Improvements" invariably meant clearing, cultivating, or creating pastures. The 1969 Forest Law prohibits further squatter settlements on public lands but is virtually unenforced. In fact, this law actually promotes irrational pilferaging of national forests by requiring a permit to sell wood and prohibiting the export of unsawn tree trunks. Because it is costly to transport and market timber and the applicant needs to prove that the clearing will indeed be an "improvement," most land clearers prefer to burn felled trees or just let them rot. At present, only 10-40% of cut trees are sold, the rest burn or decay. The permit system nonetheless has been largely disregarded; the DGF issued permits for only 30% of all timber cut in Costa Rica in 1980. Finally, higher taxes placed on naturally forested areas further enforce the attitude that cleared land is preferable.

At the same time, the government is sensitive to environmental degradation and is actively seeking a reversal of degradation trends. A recent example is the development of a national park system unsurpassed in most, if not all, of Latin America. The system of Forest Reserves, National Parks, Biological Reserves, Indian Reserves, Wildlife Refugees, Protection Zones, Cultural and National monuements, and Recreational areas encompasses 19% of the national territory. However, the government admits that its 11 Forest Reserves and seven Protection Zones are not adequately protected and administered. These areas are illegally exploited by small landholders whom the DGF cannot control.

Replanting efforts also have been made through joint Costa Rica-USAID and U.S. Peace Corps efforts. ICE and the Lands and Colonization Institute (ITCO) maintain seed nurseries and the government has set the target for reforestation at 15,000 ha/year. Unfortunately, reforestation is occurring at a rate of only 3,000 ha/year.

Because firewood and charcoal are two indigeneous energy resources, the World Bank found that as the price of oil imports increased by the end of the 1970s, demand for naturally produced energy products also increased correspondingly. The World Bank advises a three-step program for Costa Rica: 1) take advantage of illegal land-clearing by creating charcoal or fuelwood from the unused felled trees, 2) better enforce permit regulations, and 3) encourage private landowners to replant trees. Due to the precarious ecological balance, the Bank insists that intensive reforestation and forest managment programs are necessary to ensure future supplies of fuelwood and charcoal.

2.8 Fire

Fire has been neither a frequent nor devastating occurrence in Costa Rica. However, recent losses of the existing national forest to fire demonstrate that the possibility of life-threatening, ecologically destructive fires exists. And, increasing urbanization makes cities more susceptible to disasterous conflagrations.

New roads are increasing the accessibility of rural areas for settlements, and rural fires are more likely to threaten lives. The slash-and-burn method of land-clearing is still employed and has been the cause of occasional devastating fires. Finally, the San José and Limón metropolitan areas are increasingly vulnerable due not only to high population concentrations but to the newly arriving refugees and illegal aliens who are building substandard and unregulated structures on marginal lands surrounding the metropolitan areas.

A recent assessment of Costa Rica's firefighting resources (see section 3.9) indicates several locations vulnerable to conflagrations. The wood frame, cement foundation variety of construction--accounting for more than 70% of the older buildings--are prone to fires. Urban slum areas where unregulated construction results in homes built closely

together are particularly vulnerable to devastating fires. Other target hazards include the three international airports, three principal ports, approximately 20 high-rise edifices, more than 40 hazardous materials areas, more than 34 public and private hospitals, and approximately six storage areas of fuel and gases including the RECOPE petroleum refinery in Puerto Moín.

Costa Rica's firefighters respond to an average of 10,000 fire calls, 6,000 calls for emergency medical services and an additional 3,000 general emergency calls every year. From May through July 1987, national responses included fires at a schoolhouse and at a manufacturer of explosives. All firefighters respond to both urban and forest fires. A Dade County Fire and Rescue employee who performed the assessment claimed that corps of specially trained forest firefighters does not exist. (See also section 3.9, Firefighting and Emergency Services Resources).

The U.S. Government has responded to three requests from Costa Rica for assistance in fire-related incidents over the past 11 years. The first was a forest fire in Chirripo National Park which was started in March 1976 by tourists. The fire consumed 4,049 ha of both Mount Chirripo Grande--at 3,819 m the largest peak in Central America--and the northern-most paramo of the Andes. Approximately 90% of the paramo's shrubby vegetation was destroyed.

The second response came to a warehouse fire in San José that destroyed the country's entire stock of medical and surgical supplies. Most of the loss did not involve emergency supplies. However, the destruction of many items vital to the provision of medical care potentially threatened lives and warranted U.S. and other international assistance in rapidly replenishing stocks.

The final incident again involved a fire at Mount Chirripo. This time, a peasant farmer performing a slash-and-burn land-clearing operation outside the park on February 10, 1985, lost control of the fire. An emergency was not declared because lives were not threatened, but on March 8, 1985, a three-person assessment team from the U.S. Department of Agriculture's Forest Service was sent by the Office of U.S. Foreign Disaster Assistance (OFDA) to advise the Costa Rican Government on how to contain the fire. The team observed firescars from previous fires in the area. As with the fire in 1976, the April rains put out the inferno.

2.8 Refugees and Illegal Aliens

In 1985, experts estimated that up to 250,000 illegal aliens resided in Costa Rica. By 1987 an additional 19,000 Nicaraguans and Salvadorans had sought refugee status and were receiving assistance from the GOCR and the UNHCR. Central American refugees and illegal aliens replaced blacks as the largest minority group in a matter of only seven years. The group now represents 10% of the population.

Ex-president Luis Alberto Monge Alvarez described the influx of Central Americans as a "migratory timebomb." A representative of the Oscar Arias Sánchez administration claimed that it has become a massive phenomenon that will cause Costa Rica's internal problems to grow as their numbers grow. Despite fears, successive Costa Rican governments have reiterated their continued commitment to supply a haven for those seeking asylum and to provide at least the minimum standards of health services enjoyed by all Costa Rican citizens. However, as the Costa Rican economy further deteriorates and the newcomers continue to cross the border, the Ticos may need more outside assistance in providing for the illegals and the refugees.

Since 1979 when revolutions occurred in Nicaragua and El Salvador and terror escalated in Guatemala, Central Americans have suffered great dislocation. Between 1 million and 2 million became either refugees or displaced. The U.N. High Commissioner for Refugees (UNHCR) claimed that only 120,000 have benefitted from UNHCR protection and assistance. Many have sought a temporary haven and better living conditions in Costa Rica.

Salvadorans constituted the first group to arrive en mass. Since 1981, their numbers have remained stable at around 8,000 legally registered refugees cared for by the UNHCR and the GOCR. A large wave of Nicaraguan refugees began arriving in 1984 and continue to cross the border in large numbers. In 1987, there were 11,000 official Nicaraguan refugees and more than 100,000 illegal Nicaraguans residing throughout the country. Nicaraguans and Salvadorans constitute 90% of all refugees in the country; the remaining 10% are from other Latin American countries, particularly Cuba, Guatemala, Chile, Argentina, Uruguay, and Honduras.

Care of the urban and camp refugee populations is divided among the Costa Rican National Refugee Commission (CONAPARE), the UNHCR, the Costa Rican Red Cross, and the Center for Socio-Political Analysis (CASP), a group of sociologists from the University of San José.

The effects that the newcomers are having on Costa Rica are subtle but potentially devastating over the long term. They are straining the nation's health budget, exacerbating unemployment, and creating pockets of illiteracy untouched by the GOCR's extensive education program. The undocumented aliens, most of whom settle in the urban areas, are possibly the greatest burden for the Costa Rican government. Eight thousand camp refugees and 11,000 urban refugees receive assistance from the UNHCR and other non-governmental groups relieving the government from a degree of support. However, no assistance is provided for the estimated 200,000 to 250,000 illegal aliens.

The "undocumented" community usually constitues a large portion of the urban squatters who create settlements on the outskirts of Valle Central cities. Often these barrios are constructed on the most flood-prone sections of Meseta Central rivers, areas unregulated by zoning laws and without electricity, water, or sewage services.

While the government was not prepared to deal with so many illegal aliens, it was certainly not prepared for the onslaught of refugees in the late 1970s and 1980s. Four camps--Alvaperal, Boca Arenal, Tilarán, and Limón--were intended as only reception or transitory stations. However, there was no place to send the refugees, and the reception centers, built to accommodate newcomers for two weeks, housed many refugees for stays ranging from a few months to several years. The camps are overcrowded; Boca Arenal, situated on 2,000 sq. m, is home to 400 people. Limón has 850 residents. Tilarán, originally built for 1,000 people, had a population of 1,360 in 1985 with an average room occupancy rate of 20 people. The camp is known to have lodged up to 40 people in one room.

The concept of "active" centers emerged in May 1985 in response to the new wave of Nicaraguan arrivals. By designing camps that would allow refugees a degree of self-sufficiency and normalcy, the Costa Rican government acknowledged that the problem will not abate in the short-term. New active centers include Achiote, Altamirita, and Playa Blanca. Los Angeles, the sole refugee village, is strictly a center for Salvadoran refugees, many of whom have lived there between six and eight years. Figure 2.g., below, identifies the various centers.

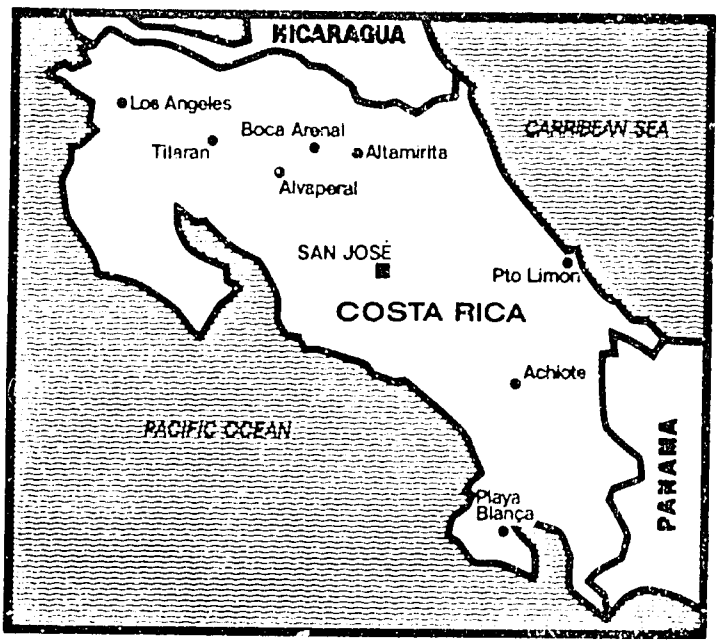


Figure 2.g.

Refugees face a gamut of difficulties. The Costa Rican government often impedes the purchase of land by individual refugees or by "active" centers. Despair, illiteracy (90%), and fertility are high in the cramped camps. In the Limón facility, CASP was forced to introduce a generally unsuccessful family planning program due to the tremendous increase in pregnancies among the women. It also promoted a literacy program.

Tensions run high between the refugees and the surrounding communities. On one occasion the Guardia Civil arrested more than 130 young men from the Limón camp on charges of robbery and assault. The authorities held 50 of the detainees for trial. The incident indirectly arose from ongoing disputes between the refugees and the surrounding communities.

Unemployment among the refugees constitutes another problem. With the deterioration of the Costa Rican economy and the growth of national unemployment and underemployment, refugees and illegal aliens compete with Ticos for increasingly scarce jobs. Only 150 of the 1,265 urban and camp refugees in Limón found employment as of late 1985. Few of those with jobs were able to obtain legal permits to work.

Probably the greatest impact of the new immigrants is on the health sector. Through large expenditures sustained mostly by foreign loans over the past seven years, the GOCR has attained a level of health care unmatched by most countries of the western hemisphere. Prevention programs have erradicated most diseases common in the developing countries. Costa Rica's morbidity patterns are closer to those of developed nations than developing nations (see Section 1.17 and 3.4). However, refugees and illegal immigrants are re-introducing a variety of diseases. Malnutrition, diseases preventable by immunization, diarrheal and respiratory disease, venereal diseases, parasitosis, pediculosis, scabies, and other skin diseases--rare even among rural Costa Ricans--are common among the refugees and undocumented aliens. A formal agreement between the UNHCR and the CCSS obliges the GOCR to extend consultations, admissions, and general health care to all refugees. New refugee demands on the health sector are becoming burdensome to the Ministry of Health and are jeopardizing the considerable achievements made through malaria erradication and other control programs.

In December 1986, supervisors at the Tilarán camp reported an outbreak of meningitis. Only two confirmed and two diagnosed cases existed among the residents of the center. However, the announcement caused panic in surrounding communities which prompted the Ministry of Health to request assistance from the UNHCR. The UNHCR responded by sending 10,000 vaccines and all refugees over two years old in the transit and active centers were vaccinated by the Costa Rican Ministry of Health. As a preventative measure, all new refugees entering the Alvaperal and Boca Arenal reception camps are immunized upon arrival.

Prospects for integration of the refugees and the undocumented are poor. While the Costa Rican government promised that no Nicaraguan will be sent home against his will, the government is increasing voluntary repatriation efforts. Salvadorans are more likely than Nicaraguans to opt for repatriation. In 1985, 26 Salvadorans and three Nicaraguans voluntarily returned to their countries, down from 1984 levels of 59 and 14, respectively. Permanent residency has been granted to few, generally Cubans or others who came to Costa Rica prior to 1979.

With continuous and escalating fighting in Nicaragua and only a semblance of security in many other Central American nations, Costa Rica anticipates further migratory flows toward the country. A study by the U.S. 361st Civil Affairs Brigade predicted that the collapse of the Sandinist regime would create an estimated 50,000 to 70,000 more refugees, many of whom would seek assistance from the government of Costa Rica. Other plausable scenarios that might generate large migratory flows include the defeat of--or loss of U.S. assistance to--the Nicaraguan contras, an escalation of tension in Panama, and the fall of U.S.-supported centrist rule in El Salvador. Residency in the existing refugee camps already exceeds capacity even though two new "active" centers have seen built over the past two years. And the existing refugees and illegal aliens are straining the social structure. A new large-scale flow of refugees would be disasterous.

3. Disaster Preparedness and Assistance

3.1 Host Country Disaster Organization

Costa Rica's National Emergency Plan--a Draft Summary document--was completed in March 1984. It is based on a 1969 law that established a National Emergency Committee under the jurisdiction of the Office of Civil Defense. The plan also provides for an Emergency Operations Center--a small communications station installed in an annex of the Presidential Palace--and a National Emergency Commission headed by an Executive Office.

According to the plan, the President directs the nation's Civil Defense during an emergency and instructs the ministries and various institutions as to their support roles. Representatives of all ministries and of selected government and private institutions form an Executive Committee of Civil Defense. The responsibilities of each delegate on the committee are outlined in the plan and include such duties as training, public awareness, evacuation, search and rescue, shelter, road infrastructure and public services development, security, first aid, food storage, damage assessment, and meteorologic and seismic reports. Manuals on an Emergency Health System and the Emergency Operations Center have been annexed to the document.

The plan is detailed and comprehensive but has not been practiced. In reality, there exists:

1) a National Emergency Commission, under the jurisdiction of the Ministry of Public Works and Transportation (MOPT);

2) an Executive Office of the Commission, which has been involved mainly with overseeing the use of emergency funds; and

3) an Emergency Operations Center, with a communications office of five radio operators who maintain 24-hour contact with groups such as the Civil and Rural Guards, the Electric Company, and the Red Cross, and inform the Vice President and others of possible emergencies.

The Office of Civil Defense--an entity directed by MOPT and created in response to the 1963 eruption of the Irazú Volcano and resultant mud-slides--has diminished considerably in size and power. Its role since its inception has been limited principally to minor flood relief and the reforestation of the slopes of Irazú.

The First Vice President is concerned with problems affecting Costa Rica's emergency response system. He and other members of the National Emergency Committee have been working with OFDA's regional office in San José to develop recommendations for a new, more effective organization. One such strategy involves the formation of a Technical Office of Disaster

Mitigation that would have decisionmaking authority and operational capacity during an emergency. The office would focus on hazard identification, mitigation, and public awareness. A strong National Emergency Commission, a depolitization of the emergency system, and the formation of an office for minor emergencies constitute other recommendations.

The current emergency laws are now under review, and both laws and institutional structures are expected to change as the new government goes through the process of reorganization.

3.2 Host Country Voluntary Organizations

Costa Rican Red Cross (CRCR) and Other Relief Organizations

The Costa Rican Red Cross (CRCR) is a large organization that promotes many activities related to disaster preparedness and relief. It is headquartered in San José at:

14th Avenue between 6th and 8th Streets
Telephone: 33-70-33.

The International Committee of the Red Cross (ICRC) and the League of Red Cross Societies (LRCS) maintain small offices at the same address.

The CRCR comprises national offices of Technical Support, First Aid, Youth, Refugees, and Training. It also operates its own blood bank. In San José, the CRCR provides most ambulance services for city hospitals and is the only source of emergency transportation for public use. (As noted in section 3.4, the Costa Rican Social Security (CCSS) ambulances cannot be used for public emergencies.) The Red Cross also maintains a small warehouse at its headquarters which is stocked with emergency supplies of cots, tents, blankets, medicine, and first-aid kits. It recently established another warehouse located several blocks from headquarters which is equipped with enough emergency supplies to care for 400 people in the event of a major disaster. Stored commodities include blankets, mattresses, cots, household utensils, medicine, surgical equipment, and spare parts for emergency vehicles.

Nationally, the CRCR administers eight regions which correspond roughly with the GOCR's administrative regions. The following lists the number of ambulances stationed in each CRCR administrative district:

Regional Headquarters		No. of Ambulances
No. 1	San José	50
No. 2	Alajuela	70
No. 3	Cartago	25
No. 4	Heredia	35
No. 5	Liberia	28
No. 6	Puntarenas	10
No. 7	Limón	15
No. 8	San Isidro del General (covers area of southern Puntarenas)	17
	TOTAL	250

Throughout the regions there are 100 national committees and about 4,000 volunteers. Most small towns have Red Cross centers and a vehicle that serves as an ambulance. Red Cross volunteers are currently working in five refugee camps that have been set up along the Nicaraguan border. The CRCR administers two of these camps in Alajuela Province. However, problems of managing the centers have discouraged the CRCR from expanded involvement in refugee programs. Current training for Red Cross personnel includes classes in emergency rescue involving aircraft accidents.

The CRCR maintains its own communications center that provides connections to regional offices through a ham radio and direct phone linkage to major hospitals in San José. Communications to rural centers from headquarters is adequate, facilitated by three strategically placed repeaters that provide good coverage. (They are located on Cerro la Muerte in San Isidro, Cerro Santa Elena in Puntarenas, and Irazú Volcano.)

The Red Cross National Relief Plan outlines CRCR responsibilities during a disaster. Major duties include the provision of first aid, food, medicine, clothing, shelter, and household supplies; participation in victim evacuation; and support of the communications and transportation networks. The CRCR, by its charter, is directed to collaborate with other international, governmental, and private organizations such as the National Emergency Committee, Civil Defense, the U.N. Disaster Relief Organization (UNDRO), CARITAS, and IMAS (GOCR Social Aid Institute).

GOCR-Related Relief Agencies

The Costa Rican Social Aid Institute (IMAS) has provided relief supplies in the past to disaster victims and has distributed USG-provided mattresses, tools, clothing, and food. IMAS and another Costa Rican community development organization, DINADECO, service the entire

country. IMAS offices are located in all ofthe larger municipalities. DINADECO representatives either visit or are based in the smallest of rural communities. Both organizations are hampered by inefficient and overly large bureaucratic systems. But their extensive penetration throughout the country and their large pools of human resources allow IMAS and DINADECO to effectively work together and distribute aid from central to regional to community levels. DINADECO community promoters are also community members familiar with the region they service and known by the local communities. During a disaster they could prove very useful in relaying information to and from isolated areas. DINADECO is also present in communities that have no Red Cross center, those with fewer than 35,000 inhabitants and no fire service, and those with fewer than 30,000 inhabitants.

Costa Rican Private Voluntary Agencies

The Costa Rican Coalition for Development Initiatives (CINDE) is a private, non-profit association established in 1983 with USAID funds to promote economic and social development through increased productivity and income generation. CINDE/FOV (Federation of Voluntary Organizations), one of its four organizational units, provides grants to local and U.S. private voluntary organizations that work primarily in areas such as training for production, technical assistance, credit, research, and organizational development. It also produces a comprehensive directory of PVOs active in Costa Rica. The 1986 edition profiles 73 organizations, listing addresses, phone numbers, objectives, assistance programs, and beneficiaries. The directory, Directorio Parcial de Organizaciones Privadas Voluntarias, is available at USAID/General Development Division (GDD), the OFDA library in AID/Washington, and from CINDE. The address in San José is: CINDE/FOV, calle 3 y 5 Avenida 1; phone: 33-17-11.

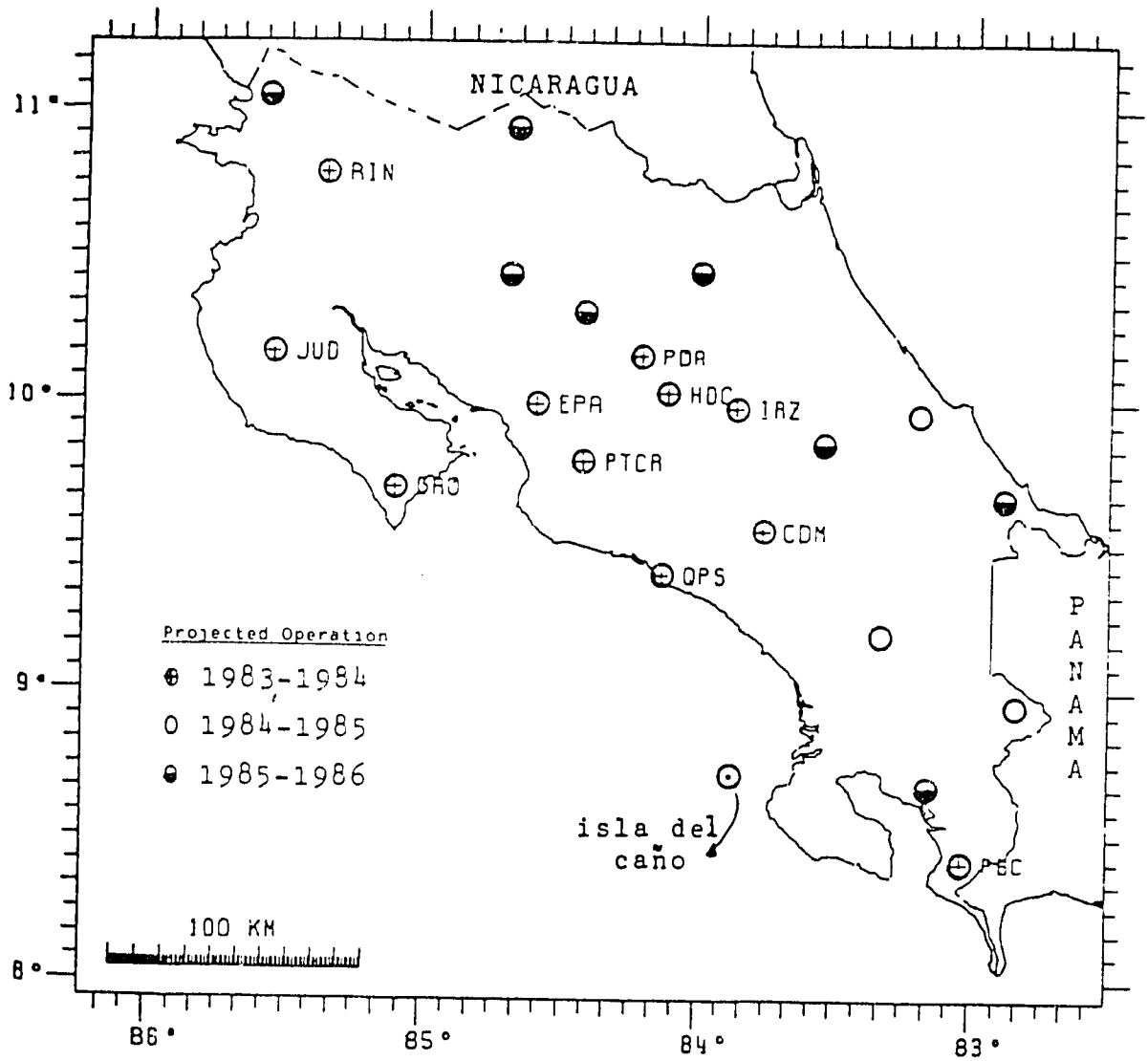
3.3 Early Warning

A permanent national seismographic network and an earthquake hazards reduction program were initiated in Costa Rica as part of a joint USAID, University of California at Santa Cruz (UCSC), and GOCR project. From September 1982 through May 1985, UCSC coordinated the program with a grant from the U.S. Office of Foreign Disaster Assistance. A complementary Earthquake and Hazards Mitigation project was funded in mid-1986 to continue this work. Costa Rican organizations involved in the project include the National University (UNA), the University of Costa Rica (UCR), the Electric Company (ICE), and Civil Defense.

By mid-1986, 12 permanent seismographic stations had been installed across the country, with three more prepared for placement. Eight of the stations were installed in the densely populated central section of Costa Rica--with two located near volcanoes Poás and Irazú--to monitor both tectonic and volcanic seismicity. The system also has seven portable

NATIONAL UNIVERSITY SEISMOGRAPHIC NET

Stations Installed and in Operation
December 1984



Station Coordinates

Name	Code	Latitude	Longitude	Elevation (Meters)
RINCON	RIN	10 46 41	85 21 50	775
JUAN DIAZ	JUD	10 09 72	85 32 82	844
COBANO	CAO	9 42 07	85 06 20	263
ESPARZA	EPA	9 59 26	84 35 79	310
QUEPOS	QPS	9 24 19	84 07 94	83
POTENCIANA	PTCR	9 47 37	84 25 57	1,510
HEREDIA	HDC	10 01 42	84 07 00	1,220
VOLCAN POAS	POA	10 09 14	84 13 02	2,093
VOLCAN IRAZU	IRZ	9 58 47	83 51 94	3,380
C. DE LA MUERTE	CDM	9 33 31	83 45 95	3,470
PUNTA BURICA	PBC	8 25 12	83 02 21	350

TIGRE	TIG----------I	
COTON	COT----------I	Operational in
ISLA DEL CAÑO	IDC----------I	1985
LIMON	LIM----------I	

Map 3.a.

seismograph units which can supplement the permanent stations during earthquake and volcano emergencies and a standby power generator. The Volcanological and Seismological Observatory of Costa Rica at UNA has a laboratory where data from the seismographic stations are recorded and studied. As part of the UCSC project, equipment was purchased and Costa Ricans were trained to operate and maintain the seismographic network as well as process and analyze incoming data. UNA also publishes monthly and yearly bulletins that report seismic events and locations.

Twenty-three strong motion accelerographs also function as part of the seismic net and are maintained by UCR's Institute of Engineering Studies. Data from these instruments are used to determine vulnerability of structures and future seismic-resistant designs. They are placed at high seismic risk sites which are of social and economic importance. Map 3.a. identifies the location of the stations.

For emergency situations, laboratory readings can be taken immediately. The preliminary location and magnitude of an event can be determined within 15 minutes of its occurrence. What the system lacks, however, is a method of informing the public. The early warning mechanism is in place, but there are no alarm systems or community awareness programs, nor a government agency--such as Civil Defense which was orginally planned to be the implementing agency--in charge of receiving and transmitting the information.

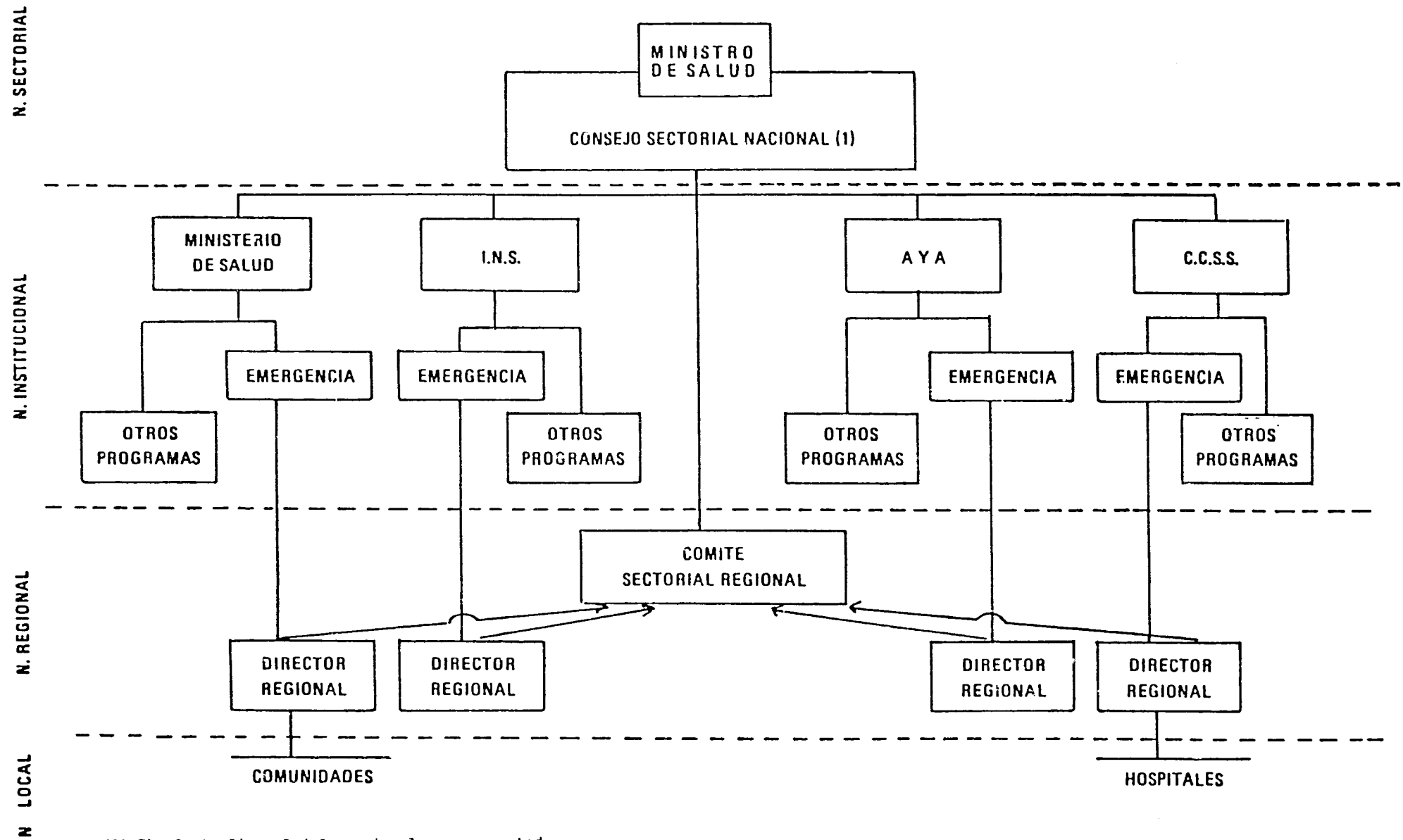
A new project, funded by OFDA and begun in mid-1986, addresses this deficiency and others. It provides for a review of equipment needs and installation to complete the seismic net, field investigations for risk mapping and production of earthquake and volcano maps of the Central Valley, training for Costa Rican technicians, and assistance to Civil Defense in the implementation of preparedness programs.

3.5 Health Sector

Costa Rica has been lauded for its comprehensive health care system and the strides that have been made in practically eliminating diseases endemic to developing nations. Its per capita expenditure for health care is by far the highest in Central America and its 1980 expenditure of 7% of its GNP on health was greater than corresponding budgets in Argentina, Brazil, Chile, Cuba, Panama, and Uruguay. Costa Rica provides health care coverage to 93% of the population.

The future holds less promise for achieving similar successes. Malaria is still a concern, although it is now principally an imported problem. Most reported cases of malaria exist among the refugees that have entered Costa Rica since 1979. However, the U.S. Public Health Service advised that a malaria risk still exists in rural areas of Alajuela, Guanacaste, Limón, and Puntarenas provinces at sites below 500 m. Indicative of the resurgence of malaria are 1983 statistics that

ORGANIZATION OF THE HEALTH SECTOR IN THE EVENT OF A DISASTER



(1) The Costa Rican Red Cross is also represented.

Figure 3.b.

report 245 new cases (of which 61% were brought into the country by foreigners). The trend is further demonstrated by the rising incidence of malaria, per 1,000 inhabitants, from .16 in 1982, .35 in 1983, and .79 in 1984.

The government, through the help of autonomous organizations, has developed an extensive system of preventative care by Latin American standards. However, an overwhelming emphasis is placed on curative medicine and health care programs despite admissions that the preventative system of health care has proved instrumental in the fight against bacterial and parasitic diseases and the dramatic decline in the mortality and morbidity rates over the past two decades.

In terms of disaster preparedness, the government admits that San José medical facilities are best equipped to manage a disaster and that the problem lies in the rural areas outside of the Valle Central. Nevertheless, strides have been made in contingency planning for health activities during a disaster. The Health Ministry has appointed a National Health Sector Emergency Commission (CONESS) which will coordinate multi-institutional efforts of agencies providing health care to disaster victims. And Dr. Lenin Sáenz, under the auspices of the Ministry of Health, has developed a comprehensive national health sector plan for disaster situations. The plan delineates general and specific responsibilities of the health sector during disasters. It also includes contingencies at the community, hospital, and national levels. Figure 3.b. details the organization of the health sector in times of disasters according to the new plan. A copy of the plan is on file at the Office of U.S. Foreign Disaster Assistance library or can be accessed through the Costa Rican Health Ministry in San José.

Structure of Costa Rican Health Services

The following organizations comprise the Costa Rican Health Sector:

- Office of the President
- Ministry of Planning and Economic Policy
- Ministry of Health - promotes health education and prevention programs
- National Insurance Institute (INS) - provides workmen's compensation insurance, sponsors research, and is concerned with sector policies
- National Water and Sewage Institute - is an autonomous institution that provides water and installs sewage systems
- The University of Costa Rica - conducts research and trains medical personnel
- Costa Rican Social Security System (CCSS) - runs all public hospitals, employs 95% of the nation's health care professionals, and administers recuperation and rehabilitation programs (including retirement and disability insurance)

Of these, the Ministry of Health, the INS, and the CCSS are the three key players. The Health Ministry receives 19% of the national budget for health activities, INS is allocated only 1%, and the CCSS is provided with 80%.

The national planning system designed in 1974 has particularly influenced the delivery of health care. The country has been divided into five regions--Central, Huetar Norte, Chorotega, Huetar Atlántica, and Brunca--and each district is administered according to health sector management plans incorporated directly into the national development plan.

Medical Facilities

The Office of Costa Rican Social Security (CCSS) reports the availability of 27 blood banks, 91 state-owned ambulances, and 139 other vehicles attached to the various medical facilities. Appendix V details the location of these resources according to regions and individual hospitals or clinics.

The Ministry of Health operates 1,025 primary health posts scattered throughout the rural areas that provide primary care, inoculations, first aid, family planning, infant nutrition, diagnosis, and initial treatment of common illnesses. Consistent with the ministry's mandate, these facilities focus on preventative health care. More sophisticated clinics are operated by CCSS. In 1985, there were 123 such clinics of which 10 were classified as Clinicas Tipo-4, 13 were type-3. 28 were type-2, and 72 were type-1 facilities. The CCSS classification code indicates the level of services available where 4 is the highest and 1 signifies that the clinic is minimally equipped. Despite categorization, CCSS clinics are prinicpally geared toward minor curative services and referrals to hospitals if a condition is serious.

Significant advances in health care in Costa Rica depend on imported technology. Indicative of the government's lack of focus on research is its paltry budget of 1% of the total health budget allocated to INS for both workmen's compenstation programs and research. Health research is performed by the Instituto de Investigaciones en Salud (INISA), the Centro de Investigación y Diagnóstico en Parasitología, the Centro de Investigación en Tecnología de Alimentos, the Instituto Clodomiro Picado, and the Centro de Investigación en Hemoglobinopatias y Sustancias Afines all at the Universidad de Costa Rica.

The 20 regional and peripheral hospitals (see Appendix V) offer routine hospitalization including such services as newborn delivery and initial treatment for accident victims. They have a combined capacity of 5,384 beds or 94.5% of all hospital beds in the country. All nine National Hospitals are located in San José. A regional hospital exists in each Limón, San José, Cartago, and Puntarenas provinces and two are based in the province of Alajuela. Four major tertiary care facilities are located in San José and can house 2,800 patients. Each provides 24-hour, seven-day/week emergency room services.

The CCSS ambulances are specifically for inter-hospital movement of patients and as such are not available to the public for field emergencies. However, the Costa Rican Red Cross ambulances are available to the public during emergency situations (see section 3.2).

3.6 Ground Transportation

Roads

Since the 1970s, road travel have become the primary means of transportation in Costa Rica. Rapid growth of motor transport in the late 1960s and early 1970s spurred extensive governmental construction of new roads. The following illustrates the rapid growth of road development since 1970:

1970.....20,575 km
1980.....27,631 km
1982.....28,525 km
1984.....29,093 km
1986.....35,684 km

The Inter-American Highway, a 683 km paved road, cuts north to south through the highland region and serves as the foundation of the national system. It has opened large areas to agricultural exploitation. With the expansion of road availability and use, the railroads and airlines have decreased considerably in importance as sources of internal passenger and cargo movement.

The Ministry of Public Works and Transportation (MOPT) reported in 1986 that the country was well covered by three classes of road systems. The National Grid, constructed and maintained by MOPT, has 7,548 km of roads. Officially maintained by the cantonal governments, the Regional or Municipal Grid is actually developed and maintained as a cooperative effort between the municipalities and MOPT because the municipalities lack the funds to effectively develop the system on their own. Finally, a system of Non-Classified roads has been developed by farmers and/or local groups to service their area. No state organization is responsible for the upkeep of these roads. In general, little emphasis is placed on road maintenance, even with regard to the national and regional grids. However, the government is attempting to use World Bank and Inter-American Development Bank funds to promote rehabilitation and maintenance projects. Drainage systems are also inadequate and desperately need rehabilitation.

The system of roads in the Meseta Central is highly developed, and all major cities are connected by paved roads. Roads in the northern and Caribbean coastal regions are generally undeveloped. When they exist, they are often dirt roads which are impassable or difficult to maneuver

most of the time due to the year-round rainy season. A new highway is being built from San José to Caldera, the new port extension of Puntarenas (see section 3.6), and a new road links San José with Puerto Limón via the cities of Guápiles and Siquirres. Finally, a new access road to the Pacific beaches--running from Playas de Jaco to Puerto Quepos to Puerto Cortés--is under construction. The following indicates the condition and amount of roads in each grid:

National Grid		Regional Grid		Non-Classified
Paved	3,328 km	Country Roads*	5,000 km	19,000 km
Unpaved*	3,488 km	Urban Streets	1,900 km	
Dirt/Earth	738 km	Other Paved	236 km	
		Dirt/Earth	2,000 km	
TOTALS	7,548 km		9,136	19,000

* Surfaced with either gravel or crushed stone

Source: Ministry of Public Works and Transportation (MOPT) interview June 1986.

In the early 1980s, the Costa Rican government announced project "Northern Zone," a joint U.S.-GOCR program of road construction in the northern regions of Costa Rica. The initiative, to be financed solely by the United States, intended to use non-combative U.S. National Guard engineering units to develop the system. Each reservist was to work for only two-weeks. Nicaragua viewed the placement of U.S. military personnel close to its border as a threat by Costa Rica. The Monge administration canceled the plan in January 1984 in an attempt to improve relations with Nicaragua.

Costa Rican roads are most vulnerable to earthquakes, flooding, and resultant landslides. Flooding affects the nation's transportation every year; however, as more and more roads are being paved to serve as all-weather routes, flooding itself is becoming less of a problem. Landslides triggered by earthquakes and heavy rains can cause a significant amount of damage. For instance, a section of mountain road destroyed by the 1983 earthquake in San Isidro del General, Perez Zeledon Canton, proved very difficult and costly to repair. During this incident, four landslides affected the Pan-American Highway cutting the major transportation route between San José and San Isidro del General. Two smaller routes were damaged by landslides cutting off the smaller towns of Alaska, Pueblo Nuevo, Río Blanco, and Rivas from San Isidro del General.

In preparation for road problems brought on by annual flooding, the government stores two or three bailey bridges for emergencies. The bridges are limited in length. The Costa Rican Institute of Electricity (ICE) and MOPT maintain additional emergency road equipment, such as bulldozers and other heavy equipment, that can be used to clear and

reconstruct roads. The equipment is distributed among six regions zoned according to geographic features. An engineer is permanently stationed in each of the six zones.

MOPT has good communication links by phone and internal communication by radio to all vehicles and regional offices. While they have some communications-support equipment, such as walkie-talkies, there is a shortage of such complementary equipment. MOPT does not maintain many fuel storage facilities although each regional office has fuel storage for general every day operations. In addition, MOPT prinicpally relies on the Costa Rican Petroleum Refinery (RECOPE) reservoirs located throughout the nation, the RECOPE transoceanic oil pipeline, and tank trucks for petroleum. Other resources include local contracting companies which construct new roads or perform major maintenance work for MOPT. These contractors have their own equipment that could be made available in case of an emergency. Most of MOPT's equipment is oriented toward maintenance.

Railroads

The railroad instrumentally assisted in the development of Costa Rica's export economy. Construction of the lines began in the 1870s and proved to be a major disaster in and of itself costing 4,000 lives, mostly to yellow fever. However, since linking Limón to San José the railroad has been a major impetus toward uniting citizens of the east coast with the central highland populus. They have alleviated shipping bottlenecks at Puntarenas by opening Puerto Limón as a major port of export for products from the east coast and the Meseta Central. With the increasing use of containerized cargo, the railroads will remain an important distribution facet of the marketing process.

Of Costa Rica's 1,286 km of track, all of which are 1,067 m gauge, 967 km are plantation lines owned by Northern Railway (336 km) and United Brands Company (631 km). Northern Railway, previously British-owned, also maintains a 166 km line between San José and Puerto Limón as well as a branch line, 21 km, between San José and Alajuela. Northern provides local service once a day between San José, Heredia, and Alajuela cities. Ferrocarril del Norte--the official name of Northern Railway--had 27 diesel locomotives, 900 freight cars, and 40 passenger cars in the early 1980s.

Ferrocarril del Sur--or Southern Railroad--provides limited public service in southern Puntarenas Province. In the early 1980s, Southern Railroad had 27 locomotives, 1,000 freight cars, 34 passenger cars, and 310 km of track which serves southern Puntarenas and the port of Golfito. The railroad belongs to the United Brand's subsidiary Bananaria de Costa Rica and principally carries bananas from the Pacific plantation to Golfito for export.

The Costa Rican Railroads (FECOSA), a subsidiary of the Costa Rican Development Corporation (CODESA), administers two railroad companies: the National Atlantic Railroad (FNA) and the Pacific Electric Railroad (FEP). FNA runs primarily between the Meseta Central and Puerto Limón. FEP connects San José and Puntarenas.

Until the mid-1960s, FNA and FEP carried the majority of commercial freight as well as served as the principal mode of passenger transport. In the early 1980s, FNA had approximately 220 km of main lines and 100 km of lines in the banana-growing areas of the east coast. Bananas constitute the majority of cargo shipped via the generally unprofitable FNA. The nation's Pacific railroad, FEP, services Puntarenas and Caldera ports. The 144 km FEP line principally transports import cargo--such as grain, fertilizer, steel tubing and car/truck parts--to the Meseta Central. Passenger traffic dropped as the road system expanded throughout the west coast. In the early 1980s, FEP owned 13 electric locomotives, four deisel locomotives, and 19 self-propelled railcars. FEP has its own hydroelectric plant which provides electricity to the lines. FECOSA also plans to electrify the entire FNA system and has completed large portions to date.

3.6 Ports

General

Puntarenas and Puerto Limón constitute Costa Rica's major national ports. Located in the Golfo de Nicoya, Puntarenas vitally tied the nation's colonial capital, Cartago, and the entire Meseta Central to Europe through the 1800s. Initial construction of Puerto Limón on the Caribbean Sea began in the late 1800s in an attempt to provide an eastern port for the banana trade. Once railroad tracks linked the Valle Central to the eastern shore in late 1890, Puerto Limón assumed a position of national importance as the major outlet for coffee.

In an attempt to ease congestion and deterioration of facilities at the two principal ports, the government constructed and upgraded ports Caldera and Moín. Caldera 20 km south of Puntarenas, was enlarged because Puntarenas had become delapidated and in need of expansion by the early 1980s. Port Caldera functions as an extension of the larger facility and is expected to grow as demands on both installations increase. The Moín port, 8 km north of Limón, was originally a specialized port for the importation of crude oil. The Costa Rican Petroleum Refinery (RECOPE), an autonomous government enterprise, oversaw the administration of the port. But, the government ordered the expansion of Moín's non-petroleum facilities under the jurisdiction of the Council of Port Administration and Economic Development of the Atlantic Shelf (JAPDEVA). The Limón and Moín ports also act as an entity under JAPDEVA administration.

Golfito, Puerto Quepos, and Punta Morales constitute three smaller, privately managed ports. Golfito located in the Golfo Dulce and Quepos on the Pacific shore handle principally banana exports. Today, Puerto Quepos is all but abandoned; it has averaged one ship per year since the early 1960s. Punta Morales is a highly specialized port for the export of sugar. Map 3.c. identifies the ports of Moin, Puerto Limón, Golfito, Puerto Quepos, Caldera, Puntarenas, and Punta Morales.

The following table illustrates the percentage of international trade by port in the early 1980s:

	Puntarenas	Puerto Limon	Golfito	Cumulative
Exports	11%	41%	38%	10%
Imports	46%	29%	10%	15%

Source: 361 Civil Affairs Brigade. Area Assessment: Costa Rica. 1983.

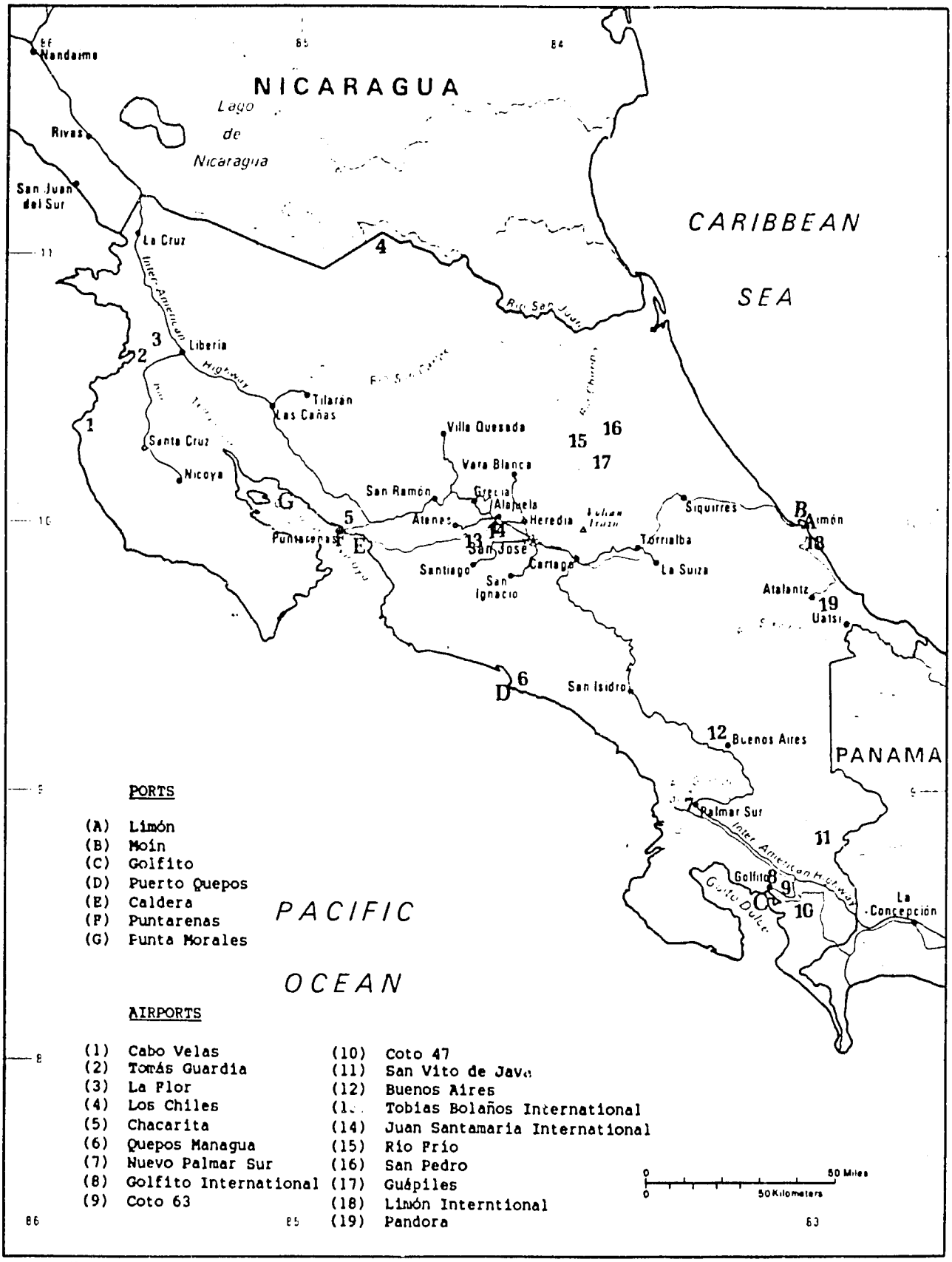
Chart 3.d. and graph 3.e. demonstrate the export and import traffic that typically takes place through the Limón and Moin piers. Common exports and imports moving through ports Limón and Moin include conventional cargo, RO-RO/LO-LO, bulk cargo, petroleum tankers, gas tankers, and fruit ships. Typical products moved through piers at Caldera, Puntarenas, and Punta Morales on the Pacific include bulk grains, wheat, sugar, and general cargo. Foreign shipping companies handle almost all trade through the principal public ports.

Administration

Two autonomous governmental entities have jurisdiction over the administration and operation of public ports. The Council of Port Administration and Economic Development of the Atlantic Shelf or JAPDEVA manages Puerto Limón, Costa Rica's largest port, and Puerto Moín. RECOPE --the Costa Rican Oil Refinery-- controls the petroleum traffic at the Moin site. The Costa Rican Institute of Pacific Ports or INCOP administers the Puntarenas and Caldera installations. JAPDEVA and INCOP function like a public utility enterprise with JAPDEVA specifically mandated to assume the responsibility of the port authority and the integral, rapid and efficient socio-economic development of the Atlantic shelf region.

COSTA RICAN PORTS &

HARD SURFACE AIRPORTS



802465 1-76 (541391)

Lambert Conformal Projection
Standard parallels 9°20' and 14°40'
Scale 1:2,400,000
Boundary representation is not necessarily authoritative

— -- Road

Map 3.c.

PERCENTAGE DISTRIBUTION OF EXPORT TONNAGE
1984

Limon-Moin Piers

	Exports in MT	%
Conventional Cargo	28,168	2
Banana Products	715,180	64
Roll-On, Roll-Off	68,747	6
Containers	289,024	25
Petroleum Products	25,298	2
Natural Gas Products	9,497	1
	1,135,914	100

PERCENTAGE DISTRIBUTION OF IMPORT TONNAGE
1984

Limon-Moin Piers

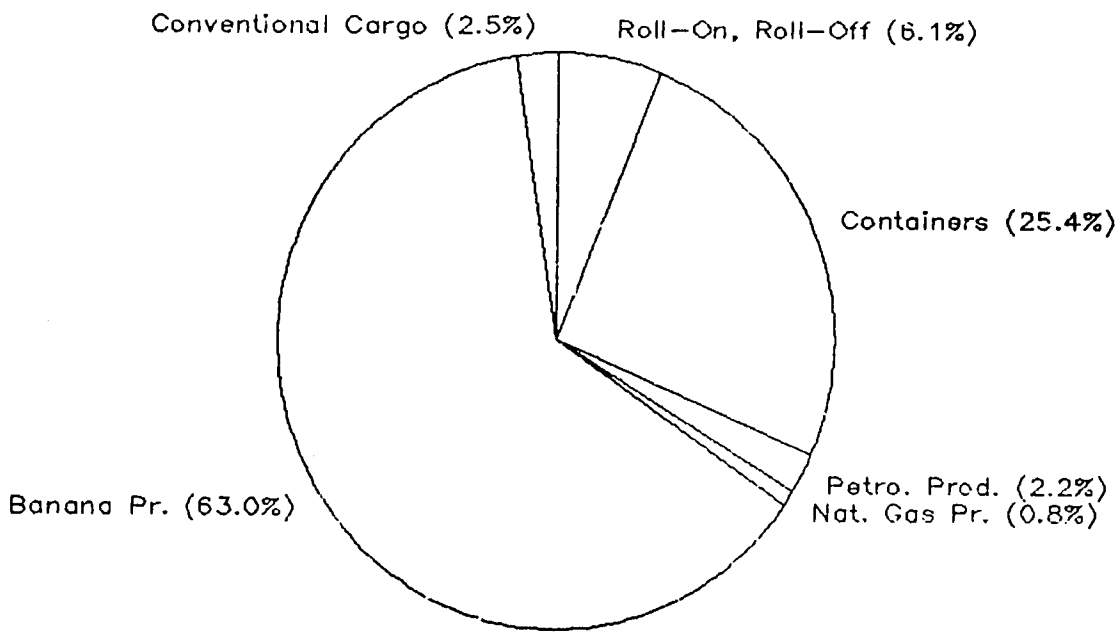
	Imports in MT	%
Conventional Cargo	226,219	21
Banana Products (general freight)	17,038	1
Roll-On, Roll-Off	75,945	7
Containers	107,106	10
Solid Bulk	29,744	3
Liquid Bulk	13,300	1
Petroleum Products	598,471	56
Natural Gas Products	10,128	1
	1,077,951	100

Source: JAPDEVA

Chart 3.d.

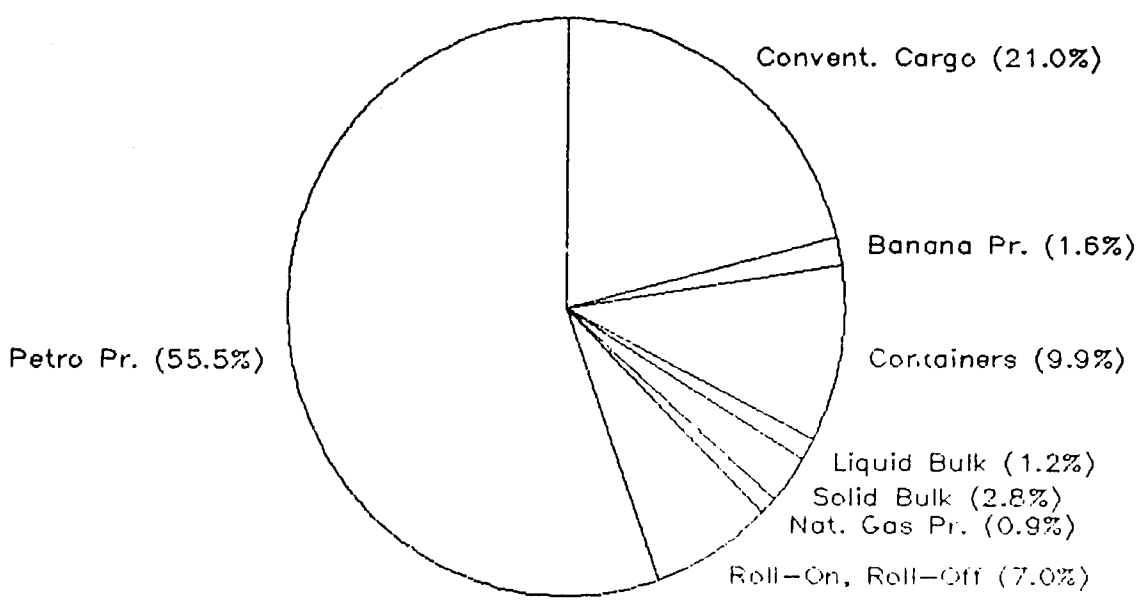
Percentage Distribution Export Tonnage

1984 Limon–Moin Piers



Percentage Distribution Import Tonnage

1984 Limon–Moin Piers



Graph 3.e.

In October 1984, JAPDEVA and INCOP initiated the Puertos Hermanos (Brother Ports) program through which they have created a basis for cooperation and coordination. The two organizations exchange personnel, technical and administrative assistance as well as supplies. Both seek reciprocal benefits through the agreement in their attempts to develop Limon and Puntarenas provinces.

Banana interests control ports Quepos and Golfito. Golfito, by far the larger of the two, is more capable of handling traffic. These facilities are considered private property and are rarely used other than by the companies' vessels. Finally, sugar interests control tiny Punta Morales on the eastern shore of Golfo de Nicoya.

PUERTO LIMON

9°59'49"N, 83°00'48"W

Principal Port of Costa Rica situated on the Caribbean Sea

Administration: Board of Port Administration and Economic Development of the Atlantic Coast
(JAPDEVA - Junta de Administracion Portuaria y de Desarrollo Economico de la vertiente Atlantica)

Approach: Hazard free enterance with depths ranging from 14.5 m to 18 m. Range of tides .2-20m

Installation: Metallic Pier includes the following berths:

Berth 1. 152m length and 10m depth alongside; used for loading bananas
Berth 2. 120m length and 9m depth alongside; used for general cargo
Berth 3. 135m length and 8m depth alongside; used for general cargo
Berth 4. 6m depth alongside
Berth 5. National Pier. 90m length and 3.9m-5.5m alongside; used for general cargo
Berth 6. 152m length and 10m depth alongside; fitted with roll-on, roll-off ramp
Berth 7. Seventy Pier. 170m length and 9m depth alongside; used for general cargo
Berth 8. 150m length and 8.5m depth alongside; used for general cargo
Berth 9. 60m length and 6m depth; used for general cargo
Berth 10. 10m depth
Berth 11. 11m depth

Four pilots are available. VHF Channel 16.

Containers are handled by mobile cranes or ship's gear. Linked quantities of ore and bulk cargo are handled at Seventy Pier. Two tug boats are of 1800 hp and 3000 hp. The Limón International Airport is 5 km from the port and the Juan Santamaria International Airport is approximately 145 km southwest of Limón. Minor ship repairs are done by local workshops. Water is available from pipes at the wharf.

Storage: Covered storage space of 18,758m^2 and open storage space of 21,000m^2

Equipment: Two cranes cap. 15 and 30t; one 10t cap mobile crane based at Seventy Pier.

Miscellaneous: 200t. of general cargo/gang/working day; 24 hours working days; local holiday - Limón Fiestas Civicas (October)

PUERTO MOIN
10°00'30"N, 85°05'W

Port situated at the End of the Tortuguero Waterway at the Mouth of the Moin River. Entrance Channel from the Caribbean.

Administration: Costa Rican Petroleum Refinery (RECOPE)

- and -

Board of Port Administration and Economic Development of the Atlantic Coast (JAPDEVA)

Installation: Three berths includes:

1. Crude Oil Berth - steel-piled, open-type wharf which is 218m long and 14.5m deep.
2. Roll-on, Roll-off Berth - 30m wide and 12m deep
3. Banana Handling Berth - steel-piles, open-type wharf 400 m long and 12m deep.

Water is available.

Equipment: Gantries available for bananas. Also, four cranes exist for the exportation of bananas; each has the capacity to transport 4,000 crates of bananas per hour.

PUNTARENAS
9°58'N, 84°49'W

The Major Pacific Port situated in the Gulf of Nicoya

Administration: Costa Rican Institute of Pacific Ports (INCOP)

Approach: Outer roadstead in open sea with sufficient depth for the largest ships. Good anchorage.

Installation: Facilities include:

1. Inside Pier - 109.7m length and depth of 7.31 m LW and 9.14 HW
2. Oil berth - 149.3m length and 7.31m depth. Air services available to San José and ship repairs and pilotage are available.
3. Outside Pier - 137.2m length and depth of 8.23 LW and 10.67 HW. Two ships at a time. Four mooring buoys anchored to cement blocks alongside the pier. Six railroad tracks run into the pier and discharge is made directly into railroad cars. Electric railway connects Puntarenas with San José, 128 km east. Water is delivered at 60t/h.

Equipment: Crane, gang way, and slings. No elevators.

Miscellaneous: Local holidays include Carnival (April) and a religious holiday (July)

CALDERA
9°54'N, 84°43'W

Pacific Port situated at the Entrance to the Gulf of Nicoya

Administration: Costa Rican Institute of Pacific Ports (INCOP)

Installation: Modern concrete wharf 490m in lenth. Three berths, including:

1. 210m length, 11m depth for vessels up to 25,000 dwt
2. 150m length, 10m depth for vessels up to 15,000 dwt
3. 130m length, 7m depth for vessels up to 5,000 dwt.

Water is available. Mooring buoys 304.8 m offshore connected to five large storage tanks by six-inch submarine pipelines. Roll-on, Roll-off cargo handled. 20 reefer point for refrigerated cargo. Discharge system with pneumatic suction units. Two tugs available, compulsory for berthing and unberthing. Juan Santamaria International Airport is 90 km from port.

Storage: Warehousing is available. Open storage area of 25,000 m^2. Silos with cap of 15,000t of storage.

Equipment: Mobile cranes of cap up to 127t and forklifts up to 35t cap

Miscellaneous: Work day is 24 hours.

Inland Waterways

Residents of the northern and northeastern coastal areas have long been dependent on inland waterways as a primary means of communications and cargo/passenger transport. The completion of the Tortuguero Canal has facilitated settlement in the northeastern coastal region as well as the transportation of cargo--particularly bananas, coconuts, cattle, and lumber products--from northern plantations and communities to the ports of Moín and Limón. The 112 km system cuts through lagoons and canals joining the Río San Juan with the Río Moín. It runs parallel to the Caribbean coastline allowing ships to avoid the rough waters of the open sea.

In addition to the Tortugero Canal, seven rivers can be navigated in the Caribbean lowlands and six running to the Pacific. Eastern rivers include the Río San Juan, which can be piloted for approximately 160 km, and two of its tributaries--the Río San Carlos and the Río Sarapiquí. Flowing from Lago de Nicaragua, the Río Frío can be traveled as well as the Colorado (for 48 km), Tortuguero (for 11.2 km) and the Sixaola (for 17.6 km) rivers. The following constitute the navigable waterways on the Pacific coastal area: Río Tempisque - 40 km; Río Grande de Térraba - 24 km; Río Bebedero - 19.2 km; Río Sierpe - 16 km; Río Coto Colorado - 14.4 km; and Río Bolsón - 6.4 km.

In contrast to the air and railroad traffic, waterway use in the northern Costa Rica and the Caribbean littoral has actually increased over the past 15 years. Economic activity has grown in this region necessitating reliable, year-round modes of transporting products to internal and external markets. Meanwhile, access road development in northeastern Costa Rica has not kept pace with construction in other parts of the country.

3.7 Airports

General

Air travel was an important transportation link between the Meseta Central and provincial towns and cities until the expansion of all-weather roads in the 1970s. While domestic passengers and freight service declined, international passager traffic increased considerably and international freight carriage increased slightly.

Only three major airports can accommodate larger aircraft. They include Juan Santamaria International Airport that services the San José/Alajuela area, Limón City, and Tomás Guardia International Airport located in Liberia, Guanacaste Province.

A consortium of private and government interests created Lineas Aereas Costarricenses (LACSA)--Costa Rica's national airline--in 1952. The government retains one-third interest in the enterprise. The LACSA fleet consists of 3 Boeing 727-200s, 2 British Aerospace Corp. IIIs, and a DC-8 for carrying freight. Domestically, the government's Servicios Aereos Nacionales (SANSA) manages passenger and cargo services. There are private companies that offer similar services; however, SANSA is the principal carrier. SANSA has 2 Casa 212C and 1 DC-3. From Monday through Saturday, SANSA flies to Guápiles, Río Frío, Puerto Limón, Puerto Quepos, and Coto 47. Tamarindo and Liberia are serviced on Monday, Wednesday, and Friday. All SANSA flights originate at the Juan Santamaria International Airport and check-in takes place at least one-hour prior to departure at the SANSA office on Paseo Drive.

The following aerodomes have a hard surface runway that is at least 4,800 km or more:

Cabo Velas
Tomás Guardia
La Flor
Chacurita
Quepos Managua
Nuevo Palmar Sur
Golfito International
Coto 63
Coto 47
Buenos Aires
Pandora
Limón International
Tobias Bolaños International
Juan Santamaria International
Guápiles
Río Frío
San Pedro
Los Chiles
San Vito de Java

See map 3.c. for the approximate locations of the above airports. There are also numerous smaller, private airfields scattered throughout the country.

International Air Service

Twenty-seven airlines provide either direct or connecting flights to and from Costa Rica. The following offer either direct service or immediate connections:

Direct	Connecting
AERONICA (Nicaragua)	AEROMEXICO
COPA (Panama)	AEROLINEAS ARGENTINAS
EASTERN	AIR FRANCE
IBERIA	AIR PANAMA
KLM (Netherlands)	ALITALIA
LACSA (Costa Rica)	AVIANCA (Colombia)
MEXICANA	BRITISH AIRWAYS
SAHSA (Honduras)	CANADA PACIFIC
SAM (Colombia)	JAPAN AIRLINES
TACA (El Salvador)	LAN CHILE
VARIG (Brazil)	LUFTHANSA
	PAN AM
	SABENA (Belgium)
	SWISS AIR
	TWA
	VIASA (Venezuela)

LACSA flies to the United States (Los Angeles, Miami, New Orleans, and Puerto Rico), Colombia, Guatemala, Honduras, Mexico, Panama, and Venezuela.

Aircraft Entry Requirements

All private and non-scheduled commericial aircraft overflying or landing for non-commercial purposes must provide at least 24-hour advance notification to the Director General of Civil Aviation, Apartado Postal 5026, San José, Costa Rica (telegraphic address: AEROCIVIL SAN JOSE; no telex available). Notification must include:

- type of aircraft and registration marks
- name of operator and purpose of flight
- dates and times of entry into and departure from Costa Rican airspace

If landing, also include:

- dates and times of arrival and departure at airport(s) of entry
- number of passengers
- type and amount of cargo

Non-scheduled commercial flights landing for commercial purposes must request permission two weeks in advance and must submit all of the above information. There are no corporate aircraft constraints.

All private and non-scheduled commercial aircraft overflying or landing for non-commercial reasons must have on board: pilot's license; current medical certificate and passport; aircraft maintenance records; aircraft operations manuals; certificate of airworthiness; and proof of aircraft insurance.

Airport Characteristics

Costa Rica has three major airports that could accommodate an airlift of disaster relief items. They include Juan Santamaria International Airport located in El Coco, 16 km northwest of San José and 4 km south of Alajuela, Limón International Airport, and Tomás Guardia International Airport which services Liberia, the capital of Guanacaste Province. There are two other major airports--Golfito International Airport and Tobias Bolaños International airports. However, Tobias Bolaños, located approximately 5 km west of San José, is used principally by light craft. And Golfito, though improved, is not equipped for jet traffic. A final word of warning about the Liberia and Puerto Limón airports--while they can handle Boeing 727s, neither has all-weather instrumentation.

The following are runway characteristics of the four major airports:

JUAN SANTAMARIA INTERNATIONAL AIRPORT

Coordinates: 09°59'58"N, 84°12'20" W
Services the San José Metropolitan area. Located in El Coco

Runway Length (M)	Runway Strength (1,000 kg)	Aircraft Accommodated (Max Weight)
3,018	280	B747

- Precision-Approach runway, Category I

LIMON INTERNATIONAL AIRPORT

Coordinates: 09°57'35"N, 83°02'30" W
Services Puerto Limón

Runway Length (M)	Runway Strength (1,000 kg)	Aircraft Accommodated (Max Weight)
1,829	41	BAC-111

- Instrument-Approach runway

TOMAS GUARDIA INTERNATIONAL AIRPORT

Coordinates: 10°36'N, 85°33'W
Services Liberia, the capital of Guanacaste Province

Runway Length (M)	Runway Strength (1,000 kg)	Aircraft Accommodated (Max Weight)
2,225	41	BAC-111

- Instrumental-Approach runway

TOBIAS BOLAÑOS INTERNATIONAL AIRPORT

Coordinates: 09°58'N, 84°09'W
Services the San José metropolitan area

Runway Length (M)	Runway Strength (1,000 kg)	Aircraft Accommodated (Max Weight)
1,006	N.A.	DC-3

Field Lighting - As the highest order of lighting for the primary runway at each airport, low-intensity runway lights and Visual Approach Slope Indicators (VASI) are available at Juan Santamaria, Limón and Tomás Guardia airports. Low-intensity approach lights are also available at Juan Santamaria. Lighting at Limón International Airport is provided only on prior request.

Miscellaneous - Customs is available on a 24-hour basis only in Juan Santamaria; in Tobias Bolaños, Limón and Tomás Guardia customs services are provided less than 24-hours per day. The administrators for all four airports share the telegraphic address: AEROCIVIL COSTA RICA.

3.8 Energy Resources

Imported petroleum has become the most important source of energy over the past two decades. In 1965, wood (including charcoal) and bagasse (vegetable wastes, often from sugar cane) met 65% of the nation's energy needs, petroleum provided 6%, and electricity accounted for only 6%. Statistics for 1981 demonstrate the dramatic change in the overall energy supply profile and the nation's augmented dependence on oil. Imported petroleum now satisfies 48% of demand while domestically produced wood and bagasse were responsible for 39% and hydroelectric for 15%. Dependence on foreign sources of petroleum products has gravely aggravated the nation's economic crisis of the 1980s.

However, Costa Rica's abundant natural resources offer a variety of energy options that can, in combination, satisfy national demand. Numerous rivers and plentiful rainfall present the possibility of eventually replacing petroleum with hydroelectric energy. Costa Rica's hydroelectric potential is enormous (theoretically 9,000 mW). The government, through the autonomous Costa Rican Institute of Electricity (ICE) and individual municipal organizations, has been pursuing projects that promote hydroelectric power as the nation's primary domestic energy resource.

The Arenal hydroelectric project is one such example. It was opened in 1979, draws on Lake Arenal in Guanacaste Province, and is capable of providing 157,000 kWs. This program is particularly unique because the course of the Río Arenal was changed so that it now flows to the Pacific Ocean, not the Caribbean Sea. In addition, a dam was constructed to raise the level of Laguna de Arenal so that water is now available even during the dry season from January through May. The year-round availability of water eliminated the need for petroleum-run deisel and gas turbine generators which filled the demand gap during the dry months when hydroelectric output diminished. The Arenal turbine generators proved economically inefficient due to the expensive petroleum input. They are not used at present but could be reactivated during an emergency.

The following identifies Costa Rica's major hydroelectric installations, when they became operational, and potential output:

Plant	Location	Opened	Potential
Arenal	Río Arenal/Laguna Arenal	1979	157,000 kW
La Garita	Río Grande de Táricoles	1958	30,000 kW
Río Macho	Río Macho, tributary of Río Reventazón	1963	120,000 kW
Cachi	Río Reventazón	1966	100,800 kW
Corobici	Río Arenal	1982	174,000 kW

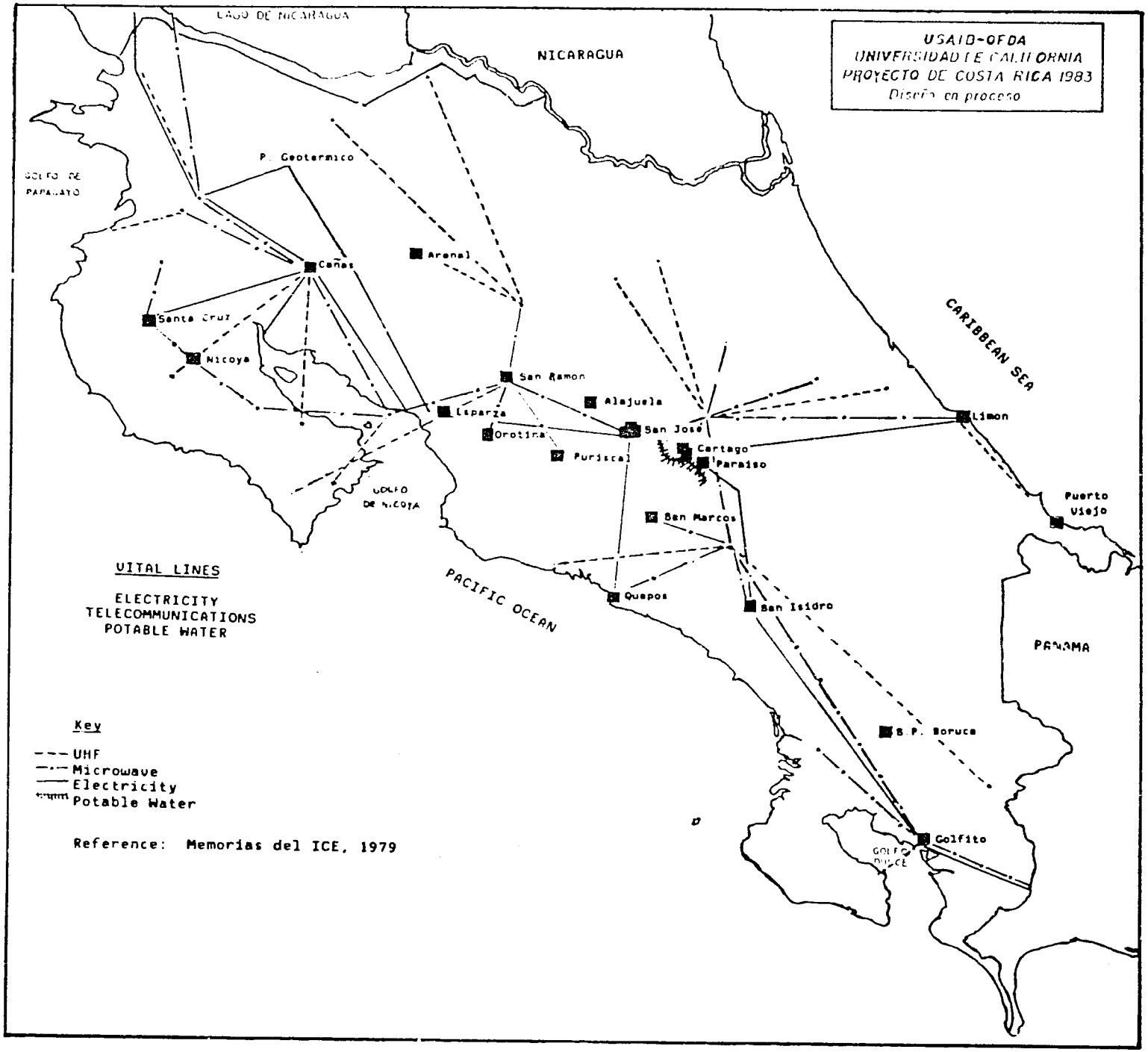
One of ICE's most successful programs has been the development of a national power grid that runs from the Nicaraguan border in northwest Guanacaste Province to Panama with branch lines to the west covering most of Nicoya Penninsula and reaching eastward to Puerto Limón. Over 75% of the population is connected to this network, but extension into rural areas is limited due to the scattered rural population and budgetary constraints. (The Inter-American Development Bank has assisted in financing rural electrification projects.) In the early 1980s, ICE initiated the development of transmission links of the grid to lines in Panama and Nicaragua (financially assisted by the IDB and the World Bank) in order to export electricity.

Other energy alternatives in the development stages include coal, gasohol, and geothermal. Coal deposits are thought to be rare and are viewed as a negligible contributor to Costa Rica's energy supply. Gasohol has been developed, but the government feels that alcohol used in its production will bring a better price if sold on the external market.

Geothermal is considered the most feasible alternative that could effectively complement output from hydroelectric plants. As national demand surpasses capacity, ICE plans to tap geothermal energy, particularly from the volcanic areas of Cordillera de Guanacaste and Cordillera Central. Present projects, including the IDB and Japanese-financed Miravalles field in Guanacaste Province, are in the survey and testing phase. Two large geothermal plants are planned for 1990 and 1993. One advantage of geothermal energy is that it could replace many petroleum-run generators that operate when water-levels are low during the dry season, thereby complementing hydroelectric power sources.

Imported petroleum has been Costa Rica's Achilles' heel. It is the only imported fuel. In 1982, payment for petroleum products represented approximately 15% of total export earnings falling from a high of 22.9% of export earnings in 1980. Since the 1980 San José Accord (a regional pact between regional oil producers Mexico and Venezuela and nine oil-importing Caribbean basin nations), Costa Rica has purchased its oil from only Mexico and Venezuela at highly favorable terms that include a provision that loans be dispersed to Costa Rica from oil income remitted to Mexico and Venezuela. Conditions on the loans are even more attractive if the loan is used for development programs, particularly those involving the energy sector. Most petroleum is bought as crude and processed at the Costa Rican Petroleum Refinery (RECOPE) at Puerto Moin.

Energy preference by household is largely a function of locality. The rural, residential, and agro-industrial areas depend much more on fuelwood, charcoal, and bagasse--their traditional energy source--although 50% of the rural sector is electrified. Urban, densely populated areas, particularly the Valle Central where approximately 75% of the population reside and of which 90% is electrified, rely much more


USAID-OFDA
UNIVERSIDAD DE CALIFORNIA
PROYECTO DE COSTA RICA 1983
Diseño en proceso
LAGO DE NICARAGUA
NICARAGUA
P. Geotermico
GOLFO DE PAPAGAYO
Cañas
Arenal
Santa Cruz
Nicoya
San Ramon
Alajuela
Liberia
Limon
Orotina
San Jose
Puriscal
Cartago
Paraiso
GOLFO DE NICOYA
Puerto Viejo
San Marcos
CARIBBEAN SEA
VITAL LINES
ELECTRICITY
TELECOMMUNICATIONS
POTABLE WATER
PACIFIC OCEAN
Quepos
San Isidro
PANAMA
B.P. Boruca
Golfito
GOLFO DULCE
Key
UHF
Microwave
Electricity
Potable Water
Reference: Memorias del ICE, 1979

Map 3.f.

on electricity, although firewood is often used extensively. A 1980s study found that wood was preferred most often as a cooking fuel due to the perceived difference in the flavor offered and the higher cost of electricity. Firewood is viewed not only as an indigineous favorite source of energy but a good candidate for export earnings. A 1980 World Bank report found that Costa Rica is among only nine Latin American and Caribbean nations with the potential of trading fuelwood. The reseachers learned, however, that replanting efforts are presently inadequate and that a concerted and expanded reforestation program is recommended if Costa Rica is to meet future needs and to reduce environmental degradation.

If there is a power failure anywhere in the nation, the computerized system at ICE's headquarters immediately identifies the problem and the location. Most repairs can be completed in a matter of hours. The electricity grid has been interconnected with sources that travel through Nicaragua to Honduras. Although the original intent was electricity exportation, the system can be tapped in case of a power failure in Costa Rica. Map 3.f. indicates the location of electric lines, potable water, and telecommunications.

3.9 Firefighting and Emergency Services Resources

The Dade County Fire and Rescue department, which has been training firefighters throughout Latin America for OFDA, recently assessed the capabilities of Costa Rica firefighters and emergency services personnel. The study indicates an inadequacy of in-country resources and personnel to meet needs for emergency assistance.

All fire stations are under the jurisdiction of the Instituto Nacional de Seguro's Cuerpo de Bomberos division in San José. A central fire station is located in each province; each province is sub-divided into zones. Stations are notified either by an emergency number or by a call from the Communications Center base-station located at the Santo Domingo fire department in Heredia Province. The national emergency access number (118) connects the caller with the San José Fire Department. If the station's own rescue squad does not take the call, it determines to whom the call is relayed, usually ending with the Costa Rican Red Cross. The San José rescue squad services only residents of the capital area.

Firefighters respond to an annual average of 10,000 fire calls, 6,000 calls for emergency medical services, and 3,000 calls for other emergency responses. Nevertheless, in-country there is only one Advanced Cardiac Life Support (ACLS) unit based in San José, eight trained paramedics, 39 fire stations, 78 pumping units, four quick response vehicles (QRV), 125 paid firefighters on duty per day, 800 volunteer

firefighters, and the Red Cross. The ACLS unit is minimally equipped with a first-aid kit and hand tools. There is a base station radio at the Santo Domingo fire station, and all emergency vehicles are equipped with radios. Finally, firefighters must depend on rivers, lakes, or stagnant water sources to fight blazes due to a lack of tankers and hydrants.

In addition to a severe equipment shortage, emergency services personnel lack adequate skills, as well as facilities for training. Training programs do not exist in extrication, heavy rescue, SCUBA rescue, and paramedic services. There is no training facility or training officer; all learning occurs on-the-job.

Disaster plans are practically non-existent. Port, airport, and road systems administrators have not devised contingency plans for disasters although the transportation network is highly vulnerable to an array of disaster-types. The sole exception is the Juan Santamaria International Airport where a disaster plan has been developed but is not practiced.

Despite the manpower, water source, and equipment deficiencies, there are no future plans for more fire stations, apparatus, personnel, or new equipment. The only area that might receive increased funding is communications.

3.10 Shelter

Basic construction techniques are similar for all types of housing in Costa Rica. Major cost differences arise from the quality of the finishing, site location, and size of lot and construction. Concrete floors, block walls, and galvanized roofs are characteristic of low- and medium-cost housing. Low-cost units usually have walls made entirely of concrete block or a combination of block, forming a three-foot high wall, and wood siding up to the roof structure. Roofing is often of corrugated zinc or asbestos panels. Most housing in San José's low-income areas is built of wood siding and/or corrugated zinc panels.

Many of San José's older homes are of wood frame construction. But the high cost of wood due to increasing transportation costs has caused it to be replaced by concrete block and related products. Although deforestation practices have depleted much wood available for housing, more economical foresting and transportation methods could eventually make wood an alternate prime material.

Urban growth, due mainly to population increase and illegal immigration, has outpaced infrastructure capacity. In San José "land invaders" have moved onto river banks, under bridges, and into other marginal areas and formed small slum settlements. This is a relatively

new phenomenon that has not yet become a large scale problem, but the Ministry of Housing estimates that up to 15,000 families are living in these high risk areas. This trend will undoubtedly increase as illegal aliens continue to enter the country in large numbers.

3.11 Communications Sector

Costa Rica has developed one of the most modern and efficient telecommunications networks in Latin America. Two government-affiliated institutions control activities of telephone and written telecommunications services. They include ICE and the Radiografica Costarricense, S.A., (RACSA).

In 1964, the Government of Costa Rica mandated that the autonomous ICE be responsible for the operation and improvement of the national and international telephone system. ICE, which also administers and finances energy development and the national system of electricity, has since taken a manually operated network of 9,200 lines in 1964 and has increased both the quantity and the quality of the system via modern technology. As of September 1982, the system comprised a total of 190,000 automatic lines.

The following are characteristics of the telecommunications system in 1985:

National Network - The national telephone system is completely automatic and covers almost all of the national territory, including rural as well as urban areas. With 11 telephones for every 100 people and availability to 81% of the population, Costa Rica has one of the highest telephone access rates in Latin America. The Long Distance Network consists of a 960 channel microwave system which traverses the country from northwest to southeast. ICE anticipates an expansion of the principal microwave routes as digital technology systems are installed.

International Network - Costa Rica is linked to COMTELCA's (the Central American Telecommunications Organization) 960 channel microwave system which also provides for television transmission. The system extends from Mexico to Panama, has 33 relay stations, and permits a change from manual to semi-automatic telephone service between Costa Rica, the rest of Central America and Mexico, and the United States. The new international telephone exchange came into service at the end of 1974 with a capacity of 600 circuits and International Direct Distance Dialing (IDDD). Capacity by the mid-1980s was 1,800 circuits. With the assistance of TARBACA--a modern tracking earth station--Costa Ricans can reach most countries of the world.

Radiografica Costarricense, S.A., (RACSA) manages Costa Rica's written telecommunications. Data Transmission and Commutation, Telex, Facsimile, Datel, Leased Channels, and the Telegraphic Service are among RACSA's responsibilities.

Telex System - The Costa Rican telex service was converted from manual to an electronic exchange in 1974 in order to handle all national and international telex traffic. The density of teleprinters in the country is the highest in Central America. Installed capacity in late 1982 was 2,016 terminations among which are RACSA-provided public booths for those users who do not have teleprinters but are interested in sending or receiving a telex.

Data Transmission Network - The DATA Transmission and Commutation system, known as RACSA-DATOS, establishes data communication between terminals and computers at low and medium speeds. The user may reach the most important public data transmission networks throughout the world such as TYMET, TELENET, and EURONET.

Satellite Earth Station - The government inaugurated a satellite earth station at the end of 1981 to expand the international circuit capacity and provide an alternate international route. The stat is the "Standard A" type and has an installed capacity of 336 circuits.

Telegraph - RACSA operates several commercial wireless stations situated in Cartago, Limon, Puntarenas, Quepos, and Golfito. It administers a 19-station, 202-office domestic telegraph network with its central station in San José. The San José station connects with international radio telegraph circuits in Nicaragua, Honduras, El Salvador, and Mexico. In addition, there are 89 official telephone stations. This service also provides ship-to-shore communications.

Leased Channels - Low- and medium speed channels are available for lease. This service offers a wide variety of voice and data uses at national and international levels to provide 24-hour direct and exclusive communication between companies. Special rates are available for international press services.

Facsimile - Telecopies of any document can be received or disseminated via the facsimile system known as RACSA FAX to a large number of countries.

Datel - Datel transmits and receives international data from the user's own terminal in a point-to-point system. Different speeds are available.

Other communications equipment in Costa Rica includes:

Voice of America Transmitting Station - The Association for Information and Culture, a business group with close links to the U.S. Embassy, has constructed and operated a VOA station in Villa Quesada, Alajuela Province, since 1985.

Radio Stations - In 1983, there were 49 medium wave, 48 frequency modulation (FM), and 10 shortwave stations. The National Radio Service operates a coast-to-coast chain of small 200-watt trans-transmitters, and the Liechtenstein government managed 15 single-kilowatt stations in 1983 scattered throughout the countryside to disseminate information and educational programs. The northern one-third of the nation receives, at best, two Costa Rican stations. The population in this region relies heavily on transmissions from Nicaragua. Based on this dependency, the government announced in September 1982 that 250-kilowatt transmitters would be constructed in northern Guanacaste and the Rio San Carlos basin, Alajuela Province, in order to offer more indigeneous programming to northern citizens.

Television - Six television relay stations existed, four of which were stationed in Buena Vista, Palmira, Turrialba, Volcane, and Golfito.

The OFDA regional advisers based in San José (see section 3.12) maintain a Communications Equipment Stockpile. This equipment is portable, battery powered, packaged in a series of 10 fibre cases, ready to be carried or shipped to the disaster site and put into operation immediately. It provides for on-the-ground radio communication within the disaster area; for longer-range communication between the affected area and the U.S. Embassy; and for international communication with OFDA in the U.S. or with any other country in the world. (However, it should be noted that HF radio communication is sometimes limited due to atmospheric conditions which affect propagation.) Among OFDA's available equipment are:

Two High-Frequency Transceivers (2 to 30 MHz range) capable of providing worldwide, as well as regional voice communication.

Four Back-Pack portable transceivers (2 to 15 MHz range) capable of providing voice communication within a 300 mile rough terrain radius. Two solar panels are included for re-charging the batteries.

Sixteen VHF hand-held "walkie-talkie" transceivers (8 in the 150-160 MHz range and 8 in the 160-170 MHz range).

Two 25 Watt mobile amplifiers for increasing the power of 2 hand-held transceivers

Note: All of the above equipment is digitally "synthesized"; i.e., frequencies can be immediately programmed, or changed. This enables the operator to utilize locally available repeaters, and provides for much wider coverage.

The team also has an HF transceiver in their "situation room" for worldwide communication during a disaster. All three team members are licensed amateur radio operators. A list of available frequencies can be obtained from Paul Bell, regional adviser, at the OFDA San José office, telephone: 33-86-45 or 33-93-29.

Costa Rican Red Cross Equipment - Considered the best equipped communications radio network of the pre-hospital services, the Costa Rican Red Cross (CRCR) stock includes 90 base stations located throughout the country. The stations can communicate with approximately 213 VHF radios. The CRCR also has 66 mobile radios or walkie-talkies making the total radio count 279. The base stations can use up to 30 different channels and can broadcast on two VHF frequencies (149 MHz simplex and 154 MHz duplex). Three CRCR-controlled repeater stations are located at Santa Elena, Buena Vista, and Mount Irazu.

An OFDA-sponsored assessment of CRCR's communications capabilities highlighted the lack of interchangeability among the CRCR's radio equipment. The CRCR uses eight brands of radios in their ambulances: General Electric; Motorola; Spectrum; Wilson; Johnson; Philips; Kenwood; and Yaesu. Furthermore, 70 of the base stations are manufactured by Kenwood and 20 by Yaesu. Parts, maintenance, and compatibility vary according to manufacturer.

The Costa Rican Fire Department - The Fire service operates General Electric equipment which is a VHF system with three channels broadcasting at 155 MHz simplex and a UHF system with repeaters on Mount Irazú and Buena Vista. The UHF system can expand to a total of five channels and broadcasts between 450 and 470 MHz. It is the only UHF system available for emergency medical purposes in the country.

CCSS - CCSS equipment consists of General Electric and Motorola brands, and 60 of its 147 ambulances are equipped with radios. The VHF system operates between 140 and 144 MHz (simplex). Most have a capacity of four channels; however, only two are in current use.

In the area of health-related communications, ambulances do not have the capability to communicate directly with hospital base-stations. The OFDA-sponsored Project Hope study recommended the addition of appropriate radio channels in ambulances and radio equipment in tertiary care hospital emergency departments.

Another potential problem with the existing communications structure is the high concentration of the publicly circulated media in San José. All newspapers and publishers operate out of the national capital as well as all transmitted television programming. Only about one-third of radio programs are broadcast from San José. If a disaster ever severely

affected the Valle Central, much of the public communications media would be affected and it would be difficult to disseminate public information via traditional sources.

3.12 U.S. Mission Disaster Plan and Resources

Mission Disaster Relief Plan

Costa Rica's Mission Disaster Relief Plan was written in February 1983. It details the Mission's role during a disaster in relation to the GOCR and AID's Office of U.S. Foreign Disaster Assistance (OFDA) in Washington, including an explanation of the chain of command and the functions of the Chief of Mission, the Mission Disaster Relief Officer (MDRO), and the members of the Emergency Action Committee. It also lists PVOs and IOs active in Costa Rica as well as host country disaster organizations and their emergency functions. Mission resources that could aid a relief effort, such as vehicles, medical supplies, and communications equipment and names and locations of disaster-related reference material and contact lists, are also included.

Although the procedural information/explanation of U.S. policy and the responsibility of OFDA and the Mission remain the same, much of the resource and contact information in the current plan is in need of revision and updating.

USAID/San José Regional Disaster Office

OFDA maintains a regional center in San José for all of Central and South America, staffed by a team of three disaster specialists. The group performs assessments following disasters in the region and coordinates the on-site OFDA response. The office is located in the USAID Annex, General Development Division, at the U.S. Embassy (telephone: 33-86-45, 33-93-29, and 24-54-14) and has the following resources:

Communications - A complete system for radio communications is maintained by the team. This equipment is portable, battery powered, packaged in a series of 10 fibre cases, ready to be carried, or shipped to the disaster site and put into operation immediately. It provides for on-the-ground radio communications within the disaster area; for longer-range communication between the affected area and the U.S. Embassy; and for international communication with OFDA in the U.S. or with any other country in the world. For more information, refer to section 3.11, Communications.

Transportation - In addition to the 10 4-wheel drive vehicles owned by the USAID Mission, the OFDA Regional Team has access to a 4-wheel drive Jeep owned by the Government of Costa Rica.

Suppliers and Contacts - The OFDA Team has compiled an inventory of suppliers of some of the locally produced items which would be required in a disaster and a list of contacts for the entire region.

Situation Room - The OFDA Team has a "situation room" in the USAID building, with maps of most of the countries of the region. The room also is equipped with a battery powered HF radio transceiver.

3.13 U.S. Disaster Relief and Preparedness Activities

Disaster Relief

Since the Office of U.S. Foreign Disaster Assistance was established in 1964, there have been 12 emergencies in Costa Rica to which the USG has responded. The following chart lists these disasters and a brief summary of USG aid.

U.S. DISASTER RELIEF TO COSTA RICA 1963-1986

Strike Date	Disaster	Commodity/ Service	Provided Through	Cost
03/18/63	VOLCANO (Irazú)	U.S. Army Survey Team Gave 10,000 Typhoid & Small-Pox Inoculations	DOD	$10,000
		Housing Project	GOCR	$1,000,000
		Alliance for Progress Grant for a Flood Project	DOD	$2,000,000
		Volcanologists to Conduct a 2-Year Study	USGS	$60,000
		2 Sanitation Experts	USPHS	
		12,000 MT of Title II Grain		$774,900
		17 MT of Title III Cheese, Flour, Butter, Rolled Wheat, and Shortening	CRS/ CARE	$8,650
		Total.....		$3,853,550

Strike Date	Disaster	Commodity/ Service	Provided Through	Cost
07/29/68	VOLCANO (Arenal)	1,172 Cots		$7,455
		2,835 Blankets		$5,971
		100 Tents		$7,995
		Hygiene and First Aid Kits & 1,000 Respirators		$1,594
		Airlift of Above Supplies	DOD	$5,869
		1 Box of Meteorological Balloons		$162
		2 Seismometers, 2 Event Counters, 25 Boxes of Seismograph Paper, & Other Seismic Equipment		$7,571
		Transport of Seismic & Volcanic Equipment		$1,351
		DOD funds; 2 Helicopters from Panama for Evacuation of Victims-(Not Used)	DOD	$2,000
		Scientists		$6,000
		1 MT of Title II NFDM		$5,826
		Total		$51,794
10/00/69	FLOOD	Helicopters for Rescue and Relief Work	DOD	$762
		Total		$762

Strike Date	Disaster	Commodity/ Service	Provided Through	Cost
04/09/70	FLOOD	3 Helicopters from Panama for Search and Rescue	DOD	$4,954
		Blankets		$600
		7 MT of Title II NFDM & Flour	CARE/ CRS	$2,700
		3 Helicopters & 3 Airplanes Flew 314 Sorties of Relief Supplies	DOD	$50,316
		Total		$58,571
12/04/70	FLOOD	Engineering Consulting Firm		$7 500
		29 MT of Title II Rolled Oats, Flour, Bulgur, Vegoil, & NFDM	CARE/ CRS	$3,974
		Rental of Road Equipment		$12,121
		Total		$23,595
04/14/73	EARTH-QUAKE	2 U.S. Army UH-1H Helicopters from Panama Flew Relief & Reconnaisance Missions	DOD	$5,399
		Raincoats, Footwear, & Towels	IMAS (Social Aid Institute)	$681
		Milk Substitute, Coffee & Food Staples	IMAS	$6,229
		Title II Food	CRS	$1,200
		Mattresses	IMAS	$1,651
		Tools	IMAS	$1,605
		Total		$16,765

Strike Date	Disaster	Commodity/ Service	Provided Through	Cost
04/01/76	FIRE	Fire Expert	USFS	$832
		Firefighting Equipment: Weather Kit; Helicopter Support Kit; & Tools	USFS	$1,085
		Total		$1,908
12/14/80	FLOOD	U.S. Army UH-1H Helicopter & 4 Support Personnel	DOD	$14,266
		Total		$14,266
04/02/83	EARTH-QUAKE	Sealift from Panama	DOD	$2,000
		3 Medical Personnel	DOD	
		40 Tents	LOCAL RC	$16,358
		Total		$18,358
07/03/83	LANDSLIDE	2 Helicopters with Crew for Rescue & Evacuation for 2 Days	DOD	$25,000
		14 Tents for Temporary 100-Bed Hospital	DOD	$36,500
		Total		$61,500
02/29/84	FIRE	Penicillin & Surgical Gloves	DOD	$25,000
		Total		$25,000
00/00/85	FIRE	Fire Experts for a Pre-Disaster Assessment		$10,000
		Total		$10,000
		TOTAL OFDA ASSISTANCE:		$4,136,077

Preparedness Activities

Costa Rica has been the beneficiary of several OFDA-funded preparedness projects. These have ranged from Costa Rican participation in international conferences and workshops to the joint USG-GCR installation of a sophisticated seismic network. Furthermore, the placement of OFDA's regional assessment team--consisting of Paul Bell, Ricardo Bermudez, and Alejandro James--and its cache of communications equipment in San José will prove particularly advantageous to Costa Rica in the event of a disaster.

The OFDA-funded participation of Costa Ricans in various programs has provided the nation with roster of individuals specialized in disaster-related activities. Costa Ricans have been trained in such areas as Geologic/Hydrologic Hazards involving volcanology and earthquake engineering, both urban and wilderness firefighting techniques, disaster mitigation methods, pesticide residue handling and analysis, and emergency health and safety topics. The following includes the projects through which Costa Ricans were trained and the date, description and number of individuals trained:

Project	Dates	Place	# of OFDA-Funded C.R. Trainees
PAHO Disaster Planning Workshop for Hospitals	Nov 19-20, 1986	San José, Costa Rica	38
CIB Congress on Building Saftey	Sep 20-27, 1986	Washington, DC, USA	n.a.
OAS/DRD Natural Hazards Training Workshop	Sep 01-26, 1986	Merida, Venezuela	1
PAHO Hospital Emergency Plans Conference	Sep 04-13, 1986	Madrid, Spain	3
PAHO Health Preparedness Workshop	Aug 18-20, 1986	Tegucigalpa, Honduras	3
Certification & Safety Conference	Jul 07-10, 1986	Orlando, FL, USA	1
Partners of the Americas' Disaster Assessment Course (I)	Apr 27, 1986 to May 18, 1986	Washington, DC, USA	1
International Health Relief Assistance in Latin America	Mar 10-12, 1986	San José, Costa Rica	n.a.
OAS Risk Assessment Course	Feb 17, 1986 to Mar 14, 1986	Merida, Venezuela	1

Project	Dates	Place	# of OFDA-Funded C.R. Trainees
USFS Wildfire Suppression Training Course	Nov 17, 1985 to Dec 06, 1985	Los Andes, Chile	1
	- and -		
	Oct 24, 1983 to Nov 10, 1983	Marana, AZ, USA	2
International Conference on Disaster Mitigation	Apr 15, 1984 to Jun 30, 1985	Ocho Rios, Jamaica	n.a.
Costa Rica Seismographic Network & Hazards Reduction Program	Sep 30, 1982 to May 31, 1985	Costa Rica	n.a.
Pesticide Residue Training Program	Apr 15, 1984 to May 01, 1985	Miami, FL, USA	1
Eighth World Conference on Earthquake Engineering	Jul 21-28, 1984	San Francisco, CA, USA	1
Emergency Management Training Course	Jul 15-28, 1984	Costa Rica	n.a.
Pacific Volcanology Seminar	Jun 09-11, 1984	Hilo, HI, USA	n.a.
USGS Geologic Hazards Program	Mar 05, 1984 to Mar 30, 1984	Denver, CO, USA	2
Firefighting Training	Feb 11-15, 1984	Los Angeles, CA, USA	4
Costa Rica Seismic Network	Oct 16-22, 1983	Costa Rica	n.a.
Peace Corps Disaster Preparedness Conference	May 21-24, 1982	Quito, Ecuador	1

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Source: Computer databases (Preparedness File and Participants Training File) at the Office of U.S. Foreign Disaster Assistance.

The Office of Foreign Disaster Assistance has been involved in three major preparedness activities in Costa Rica. They include:

1. Seismographic Network and Earthquake Hazards Reduction Program - The GOCR, the University of California at Santa Cruz (USCS), and AID/OFDA combined efforts to install a series of seismographic

stations that monitor ground movement and volcanic activity. For a detailed discussion of the project, see section 3.3, Early Warning.

2. The USAID/San José Regional Disaster Office - Disaster assessment specialists are headquartered at the USAID/Costa Rica offices at the U.S. embassy to survey disaster needs in Latin America and the Caribbean. The capabilities and available equipment of this disaster team is detailed in section 3.12, U.S. Mission Disaster Relief Plan and Resources and section 3.11 Communications.

3. Project Hope Emergency Medical Services Manpower Development Program - Project Hope, in cooperation with the Ministry of Health and the CCSS, is establishing an emergency medical service system in San José. The program is in its early stages and will take approximately three years to complete. During the implementation phase a cadre of physicians, nurses, paramedics, and medical technicians will be trained. Project Hope anticipates that 200 emergency medical technicians (EMTs), 20 paramedics, 1,985 basic and advanced life support personnel, and 95 nurses will undergo emergency and critical care training by the end of the program. A School of Respiratory Therapy and a pulmonary critical care nurse's training program will be created and serve to introduce new technologies and techniques to the Costa Rican medical community. With heart disease a relatively new phenomenon and now one of the top killers among Ticos, emergency medical services and advanced cardiac training has become essential in Costa Rica.

3.14 U.S. Voluntary Agencies and International Organizations

The principal U.S. voluntary and international organizations working in Costa Rica include the following:

CARE
Calle 23; Avenidas 12 y 14
Apartado 3571
San José
Tel.: 33-98-87, 33-98-64

Programs include food supply, food-for-work, P.L. 480, mother/child health, agricultural training, potable water, and community centers. CARE works with the GOCR's Ministries of Health and Agriculture and the National Institutes of Insurance and Social Assistance.

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Caritas de Costa Rica
Barrio La Cruz, 150 metros sur de La Cruz, Casa #3630
Apartado 5160-1000
San José
Tel.: 27-23-58, 27-05-95

Programs include the creation of work for refugees, the formation of volunteers to work with the poor, and the assistance of people unable to work due to illness and age as well as women with small children. Caritas provides food and clothes to those in need. Caritas network is national and could assist in distributing relief supplies in the event of an emergency.

- - - - - - - - - - -

Catholic Relief Services (CRS)
Apartado 5483-1000
San José
Tel.: 31-49-67

Programs include cooperatives, agricultural training, nutrition and public health education, clinics, refugees, and food distribution centers. CRS works with Caritas de Costa Rica, supplying Caritas with food and medicines that are stored for possible use in an emergency.

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Church World Service
a/c Asociación Caravanas de Buena Voluntad (Goodwill Caravans)
Apartado 10250-1000
San José
Tel.: 26-63-50, 26-35-71

Programs focus on food and medical supplies in cooperation with the local Goodwill Caravans.

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Goodwill Caravans
(Asociación Caravanas de Buena Voluntad)
San Francisco de Dos Rios (behind the Radio Emisora Faro del Caribe)
Apartado 10250-1000
San José
Tel.: 26-63-50

Programs include the provision of medical assistance as well as other social services benefiting women, the poor, communities, and Costa Rican youth. The organization also provides assistance to farmers and health education to various communities throughout the country. Through its emergency program, Goodwill Caravans has the resources to mobilize and distribute food, medical, and general aid.

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International Committee of the Red Cross (ICRC) &
League of Red Cross Societies
14th Avenue between 6th and 8th Streets
San José
Tel.: 33-70-33

Have small offices close to the Costa Rican Red Cross (CRCR). (For information on the CRCR, refer to section 3.2).

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Lutheran World Relief, Inc. (LWR)
a/c Asociación Caravanas de Buena Voluntad
Apartado 10250
San José
Tel.: 26-63-50, 26-35-71

LWR cooperates with CWS and Goodwill Caravans. Programs include agricultural cooperatives, community centers, nutrition education, potable water, preventive medicine, and sanitation.

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Partners of the Americas
a/c Dr. Sherman Thomas
Apartado 219 Desamparados
San José
Tel.: 25-87-88

Programs utilize local and U.S. volunteers to promote educational exchange, vocational and women's education, and rehabilitation.

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The Salvation Army
Avenida 5ª, entre 6 y 8
Apartado 6227
San José
Tel.: 21-82-66

Programs include resettlement and social welfare.

- - - - - - - - - - -

Southern Baptist Convention
Apartado 4035-1000
San José
Tel.: 25-48-85

Works through local churches in cooperation with CESAD, a consortium of evangelical denominations organized to carry out relief efforts. Programs focus on food distribution centers and refugees.

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United Nations Development Program (UNDP)
Los Yoses 100 Sur de la 4a Entrada
Apartado 4540-1000
San José
Tel: 25-03-65

- - - - - - - - - - -

United Nations High Commissioner for Refugees (UNHCR)
300 metros Este de la Iglesia Santa Teresita
Barrio Escalante
Apartado 12
Ferrocarril al Pacifico
Tel.: 24-87-97

Operates refugee camps in Tilarán, Boca Arenal, Alvaperal, Limón, and Achiote as well as a refugee village in Los Angeles (used principally by the El Salvador refugees).

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World Concern
a/c Caravanas de Buena Voluntad
Apartado 10250-1000
San José
Tel.: 26-35-71

Programs focus on agricultural training in cooperation with Goodwill Caravans and the Ministry of Health.

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World Food Program (WFP)
a/c United Nations
Los Yoses 100 Sur de la 4a Entrada
Apartado 4540-1000
San José
Tel.: 24-52-81

- - - - - - - - - -

Pan American Health Organization/World Health Organization
(PAHO/WHO)
a/c Dr. Hugo Prado Monje
Emergency Preparedness & Disaster Relief Coordinator
Apartado 3745-1000
San José
Tel: 33-38-63, 22-35-78

- - - - - - - - - -

World Vision International (WVI)
Curridabat Apartado 133
San José

WVI works through local churches and municipal institutions and focuses on disaster relief and rehabilitation.

Appendix I

Warehouse Fire
San José, Costa Rica
February 29, 1984

The following case reports are annexed in order to provide information on disasters declared since 1980. They are representative of three of the four major disaster-types common to Costa Rica - fire, earthquake, and flood. The fourth type, volcanic eruption, has not occurred during the 1980s.)

COSTA RICA - Fire

Date: February 29, 1984

Location: San José

No. Dead: None

Damage: Approximately $2.5 million in drugs and medical supplies were destroyed

The Disaster

A fire in a warehouse consumed over $2.5 million worth of medical and surgical supplies representing the entire store of such supplies in Costa Rica. The supplies had been stored in the warehouse by the Costa Rica Social Security (CRSS) prior to being sent to regional centers which service the nation's network of health posts and hospitals. All hospitals in the country are operated and supplied by CRSS.

While most of the loss did not involve emergency supplies, many articles vital to the provision of medical care were destroyed. The fire depleted these supplies, creating a potentially life-threatening situation.

Action Taken by the Government of Costa Rica (GORC)

The Director of the CRSS, Dr. Guido Miranda, ordered a detailed assessment of the losses from the fire. A report was prepared identifying priority items; total in-country supplies; and anticipated depletion date.

Because the CRSS had no mechanism for emergency procurement and any stocks ordered would take at least two months to arrive, CRSS director Miranda turned to the United States for assistance in obtaining a two-month supply of critical materials.

Assistance Provided by the United States Government

After receiving the request from the Director of CCSS, the Chief of Mission determined that a potentially life-threatening situation created by the loss of medical supplies in the fire existed and declared that U.S. disaster assistance was warranted. On March 9, the Chief of Mission requested assistance from OFDA in procuring a two-month supply of medicaments.

OFDA's Medical Adviser identified the most critically needed supplies as well as sources for obtaining the drugs.

At the request of USAID/Costa Rica, the following supplies were procured in the United States and shipped via air freight to San José:

Penicillin V, 400,000 units 200 bottles of 100 tablets	Penicillin G, potassium 5 million units 7,000 bottles of each
Surgical gloves 9,000 pairs	Sulfamethoxazole/Trimethoprim 475 bottles of 500 tablets each
Chromic 0, 54 inch sutures 75 dozen	Sterilization monitors 4 boxes of 100 each

Total cost of procurement and transport of these supplies was $25,000.

TOTAL $25,000

Assistance Provided by U.S. Voluntary Agencies

None reported

Assistance Provided by the International Community

PAHO - Resident representative reviewed CRSS list of required drugs and assisted in establishing priorities relative to the CRSS request.

Appendix II

Earthquakes
Costa Rica
April 2, 1983, and July 3, 1983

COSTA RICA - Earthquake

Date: April 2, 1983 and July 3, 1983 (FY 83)

Location: April 2 earthquake - 14 km northeast of the banana port of Golfito and 175 km southeast of the capital city of San José

July 3 earthquake - epicenter located in the Division River Valley, 10 km north of San Isidro del General in San José Province and 60 km southwest of San José

No. Dead: Two

No. Affected: April 2 earthquake - 200 persons injured, 30 hospitalized, and 95 families homeless; July 3 earthquake - 5,000 persons evacuated from mountain villages in the earthquake zone

Damage: April 2 earthquake - Numerous reports of property damage; brief power and telephone outages in many areas; several small houses severely damaged or destroyed; slight displacement of numerous bridges on the Pan American Highway; extensive damage to concrete public buildings, movie theaters, and schools; July 3 earthquake - 30 to 50 houses destroyed in the San Isidro area; the San Isidro General Hospital damaged; towns of Quepos, Golfito, and Pacayas damaged; numerous landslides along the Pan American Highway

The Disaster

On the evening of April 2, 1983, an earthquake measuring 7.1 on the Richter scale struck Costa Rica in an area 14 km northeast of the banana port of Golfito and 175 km southeast of San José. The earthquake resulted in one death, 200 injuries, and 30 people hospitalized; 95 families were made homeless. Reports of property damage were numerous, and there were brief power and telephone outages in many areas. The Costa Rican press reported that several small houses were severely damaged or destroyed. There were no reports of serious structural damage in San José. A local car dealership suffered extensive damage when the water tank on the building's roof collapsed and fell into the building. Several churches were reported damaged and closed temporarily.

There was slight displacement of many minor bridges on the Pan American Highway and serious damage to one major bridge. Extensive damage occurred to concrete public buildings, movie theaters, and schools in the affected area.

On July 3, a second major earthquake, measuring 5.5 on the Richter scale, struck the Division River Valley, 10 km to the north of San Isidro del General, San José Province, and 60 km southwest of San José. One person was killed and hundreds of injuries were reported. Between 30 and 50 houses were demolished in the San Isidro area. San Isidro General Hospital was evacuated and several patients were flown to hospitals in San José. The towns of Quepos, Golfito, and Pacayas also suffered structural damage. Major landslides trapped 300 to 400 people along a 100 km stretch of the Pan-American Highway connecting San Isidro and San José. One landslide covered 100 m of highway with debris piled 25 m high. In other areas the highway collapsed, leaving impassable crevices. Road traffic to San Isidro and south to Panama was halted as a result.

Action Taken by the Government of Costa Rica (GOCR) and Local Voluntary Groups

The GOCR responded to the disasters through the Instituto Mixto de Ayuda Social (Joint Social Aid Institute) with tents, mattresses and cots, blankets, kitchen utensils, clothing, and construction materials (roofing and nails). The GOCR also made several aerial surveys to assess the damage. The Ministry of Public Works and Transport worked to clear dirt and debris from the Pan-American Highway, as well as to make repairs. The Government also provided 5,000 gallons of fuel by tanker truck at San Isidro for the refueling of the helicopters provided by the United States.

The Costa Rica Red Cross worked alongside the GOCR to provide food, shelter, and other aid. The Red Cross set up a 12-tent camp and arranged other temporary living quarters near La Georgina and San Isidro to care for 216 persons. An additional 358 people were housed in a Red Cross-operated camp at Villamils. The National Food Program, with help from Caritas, distributed food valued at $2,685 to affected families. Several Costa Rican communities collected food locally for distribution.

Assistance Provided by the United States Government (USG)

On April 6, 1983, the U.S. Ambassador to Costa Rica, Francis J. McNeil, determined that the earthquake disaster warranted USG assistance. Accordingly, he exercised his disaster assistance authority, requesting the release of 40 tents and tent flies from the Office of U.S. Foreign Disaster Assistance (OFDA) stockpile in Panama. The value of this contribution, including transportation and replacement costs, totaled $18,358. These tents, granted to the Costa Rica Red Cross, were used to provide shelter for homeless families in the affected areas of Golfito, Puerto Cortez, and the canton of Osa. When the emergency phase passed and the tents were no longer needed, the Red Cross placed them in warehouses for use in future disasters.

In response to the occurrence of the second earthquake on July 3, Ambassador McNeil again exercised his disaster assistance authority. On request of the GOCR, the USG, through OFDA, authorized the dispatch of two U.S. military helicopters to assist in the evacuation of persons trapped on the Pan American Highway. The crews of the two helicopters flew a total of 37 missions during the two-day operation and brought 326 people to safety. The helicopters landed in six small mountain villages located within an 80 sq. km area around the epicenter of the earthquake, evacuating only those people who could not walk or be carried out. The helicopters also carried basic food supplies to victims who had not eaten in more than two days and flew several reconnaissance missions to assess damages to the Pan-American Highway and to power lines in the area. Total costs of the evacuation operation were $25,000.

The second quake also resulted in severe structural damage to the hospital in San Isidro, rendering it nonfunctional. OFDA authorized the loan of 14 medium size military tents from DOD stocks to the GOCR for the purpose of erecting a 100-bed temporary hospital. In addition, temporary personnel were provided to help erect the tents, and three medical corpsmen were detailed to the hospital for four months. The total cost of the tents and personnel assistance was $36,500, including transportation and retrograde costs.

Summary of USG Assistance

U.S. Ambassador's authority used to purchase and transport 40 tents and tent flies to the Costa Rica Red Cross for the victims of the April 2 earthquake	$18,358
U.S. Ambassador's authority used to provide two helicopters and crew for evacuation mission	$25,000
Provision of 14 military tents and personnel for 100-bed temporary hospital	$36,500
TOTAL	$79,858

Assistance Provided by U.S. Voluntary Agencies

CARE - donated the following P.L. 480 food commodities from existing stocks in Costa Rica: 1,966 kg of vitaleche, 1,035 kg of masarina, 828 kg of fresco-orchata, and 365 gallons of vegetable oil. The food, which constituted a two-week supply for 3,450 people, was donated to the GOCR family assistance agency.

Assistance Provided by the International Community

Caritas - with the GOCR National Food Program, distributed food to affected families. Caritas also donated medicines and clothing received from Switzerland.

Appendix III

Flooding
Atlantic Coastal Regions of Costa Rica
December 1981

COSTA RICA - Floods

Date: December 14-21, 1980 (FY 81)

Location: Coastal areas in the Atlantic Zone

No. Dead: One

No. Displaced: 1,350

No. Affected: 200,000 (total population of affected area)

Damage: Homes inundated; personal belongings damaged; agricultural land, roads, and railroads flooded.

The Disaster

Four days of heavy rains during the second week of December 1980 caused serious flooding along the Atlantic coast from the city of Limon to the Nicaraguan border. Towns affected included Limon, Matina, Tortuguero, Barra del Colorado, Chirripo, Parasmina, and Bataan. Flooded roads and railroads left many of these communities isolated and without access to supplies of food, medicine, and fuel.

Action Taken by the Government of Costa Rica (GOCR)

Because the only GOCR helicopter capable of relief and rescue work was out of commission, President Carzo and Vice President Altmann requested helicopter support from the United States Mission in Costa Rica.

The local disaster relief effort was coordinated through Japdeva, the Port Administration and Economic Development Board of the Atlantic Coast, in Limon and the Costa Rican Red Cross. These agencies evacuated individuals stranded by the flooding, provided locally available relief supplies to victims, and established refugee centers in Limon, Colorado, Matina, and Tortuguero for those persons displaced from their homes. Approximately 1,350 persons were assisted by Japdeva and the Red Cross in refugee stations, or were otherwise relocated from their homes to places of safety.

In addition, food, clothing, medicine, and other supplies valued at more than $350,000 were provided by Costa Rican sources through Japdeva and the Red Cross.

Assistance Provided by the United States Government (USG)

On December 14, 1980, the Ambassador declared the situation to be a medium-intensity, local disaster and U.S. helicopter support was requested from USSOUTHCOM. A UH-1H helicopter and four U.S. Army personnel arrived in San José on December 15 and proceeded to Limon the next day where relief and rescue operations were begun in cooperation with Japdeva. A total of ten missions were flown; 54 people were evacuated by U.S. helicopter and 9,500 lbs. of food, medical supplies, and fuel were delivered to isolated refugee stations.

Funds to pay for the helicopter and TDY for the accompanying U.S. Army personnel came from the Ambassador's Disaster Relief Authority:

Flying time of 29.1 hours for one U.S. Army UH-1H helicopter at $416 per hour.....$12,106

TDY for four U.S. Army personnel at $540 per person..... .....$2,160

TOTAL $14,266

Assistance Provided by U.S. Voluntary Agencies

Church World Service - donated $2,500 to Goodwill Caravans of Costa Rica to aid in the reconstruction of 70 homes in the poorest neighborhoods south of San José.

TOTAL $2,500

Assistance Provided by the International Community

None reported.

* Please note: the figure for total U.S. voluntary agency assistance is an approximation. In many cases, the cash value of in kind aid is unavailable.

APPENDIX IV

EARTHQUAKE AND VOLCANIC ACTIVITY

TYPE	DATE	DESCRIPTION OF DAMAGE
E	1638-1640	Report of damage in central part of Costa Rica.
E	1678	Reported damage to churches in Cartago, Central Costa Rica. Probably the earthquake for which "St. Gregorio Day" was established with Mass celebrated on the anniversary of the "great earthquake" for many years to follow.
V	1723	Irazú and Turrialba volcanoes caused damage in nearby towns, particularly Cartago.
V	1726	Irazú continued activity.
E	1728	Houses damage by earthquake in Cartago.
E	1756	A large earthquake with many aftershocks occurred. Extensive damage was reported in central Costa Rica. People ran out of houses to pray at open places, "the streets and open places were crowded with people praying for mercy." Called the "Earthquakes of St. Buenaventura."
E	1780	Churches were damaged in Cartago, Alajuela, and Guanacaste (church in Cartago had to be closed). The municipal council of Cartago later (1823) ordered Masses to be celebrated, apparently in honor of these earthquakes.
V	1821	Eruption of Irazú.
E	1822	Substantial damage in Cartago and San José, many houses destroyed by the earthquake. Also serious damage was reported at Matina in the Atlantic side of Costa Rica. Irazú volcano blamed for the earthquake. Municipal government house and church in San José had to be demolished. In San José, this date was established for the celebration, thereafter, of a Mass of the "Lord of San José."
E,V	1834	Poás volcano erupted accompanied by minor earthquakes in central Costa Rica.
E,V	1841	Most catastrophic earthquake recorded in history. Cartago was severely damaged, 16 people reported dead. Also severe damage reported at Tres Ríos and Curridabat central Costa Rica where 15 people died. In Cartago, 391 houses out of 600 and 5 out of 7 churches were destroyed. Damage was produced in a radius of 30 km from Cartago, many other houses in the vicinity were destroyed. In total, 4205 houses were damaged beyond repair in the cities of Cartago, San José, Heredia, and Alajuela. Irazú volcano active.

E = Earthquake, V = Volcanic Eruption

TYPE	DATE	DESCRIPTION OF DAMAGE
V	1842	Eruption of Irazú volcano.
E	10/1888 to 02/1889	Many foreshocks until December 30 at 04:12 a.m. main shock. Some houses completely destroyed, damage to public buildings in San José. Also some buildings suffered damage in Alajuela and Heredia. Large number of monuments were rotated in local cemeteries. In San José, Heredia, and Alajuela, 123 houses collapsed, 1,215 were severely damaged and had to be torn down, and 2,193 needed repair; 12 public buildings either collapsed or were no longer usable and 39 needed repair. Also felt in Limón.
V	07/1904 to 10/1904	Eruption of Poás volcano.
V	1905	Repeated eruptions of Poás.
V	1906	Poás still active.
V	1910	Poas made one of the largest eruption recorded January 25. Strong earthquake felt in Santa Maria de Dota, San Pablo, and Corralito (central Costa Rica) on March 10.
E	04/03/1910	Violent earthquake felt in the Central Valley (San José and Cartago). Many objects fell in houses and stores. First intensity map constructed for an earthquake in Costa Rica. Many aftershocks were felt after main shock.
E	05/04/1910	Severe destruction in Cartago and lesser in Paraiso, Tierra Blanca, Agua Caliente, and Hervidero. 600 people killed. Also some damage reported in San José, Heredia, San Rafael, Tarrazu, and Orozi. Limit of shaking area was Limón, Nicoya Peninsula, and Golfo Dulce. In Cartago, 60% of the houses and public buildings were destroyed by the violent earthquake; 20% of these were damaged beyond repair.

E = Earthquake, V = Volcanic Eruption

Source: Gonzalez Viquez, Lic. Cleto and Avelino Asina. 1608-1910: Temblores, Terrmotos, Inundaciones Erupcioues Volcanicas en Costa Rica. (San José), 1921.

APPENDIX V

NUMBER OF HOSPITAL BEDS, BLOOD BANKS, AMBULANCES AND OTHER VEHICLES
ACCORDING TO REGION AND MEDICAL CENTER
1985

Location	Type	# of Beds	Blood Bank	Ambu-lances	Other Vehicles
REGION CENTRAL		5,388	14	50	76
(REGION CENTRAL NORTE)		(1,995)	(7)	(23)	(34)
SAN JOSÉ PROVINCE					
Hospital México	N	631	1	4	1
Hospital Dr. Calderón Guardia	N	508	1	3	3
Hospital Nacional de Rehabilitación	N	92	1	2	2
Hospital Dr. Raúl Blanco Cervantes	N	213	--	2	2
Clínica Dr. Clorito Picado	4	--	--	--	1
Clínica Dr. Jiménez Núñez	4	--	--	1	--
HEREDIA PROVINCE					
Hospital San Vicente de Paúl	P	117	1	2	1
Clínica Dr. Francisco Bolaños	4	--	--	--	2
Clínica San Rafael	3	--	--	--	1
Clínica Santo Domingo	3	--	--	--	1
Clínica Jorge Volio (San Joaquín)	1	--	--	--	1
ALAJUELA PROVINCE					
Hospital San Rafael	R	225	1	1	2
Hospital San Francisco de Asís	P	83	1	2	2
Hospital Dr. Carlos Luis Valverde Vega	P	126	1	1	1
Clínica Dr. Marcial Rodríguez	4	--	--	2	3
Clínica San Ramón	3	--	--	1	1
Clínica Naranjo	3	--	--	1	--
Clínica Orotina	2	--	--	1	1
Clínica Palmares	2	--	--	--	1
Clínica San Pedro de Poás	2	--	--	--	1
Clínica Alfaro Ruiz		--	--	--	1
Clínica Valverde Vega	2	--	--	--	1
Clínica Atenas	2	--	--	--	1
Clínica Carrizal	1	--	--	--	1
Clínica Sabanilla	1	--	--	--	1
Clínica San Rafael de Ojo de Agua	1	--	--	--	1
Clínica La Luisa	1	--	--	--	1

N = National Hospital
R = Regional Hospital
P = Peripheral Hospital

Location	Type	# of Beds	Blood Bank	Ambu-lances	Other Vehicles
(REGION CENTRAL SUR)		(3,393)	(7)	(27)	(42)
SAN JOSÉ PROVINCE					
Hospital San Juan de Dios	N	916	1	2	6
Hospital Dr. Carlos Sáenz Herrera	N	404	1	3	4
Hospital Materno Infantil Carit	N	120	1	--	1
Hospital Dr. Chacón Paut	N	320	--	1	1
Hospital Nacional Psiquiátrico	N	1,143	1	1	3
Clínica Dr. Solón Nuñez	4	--	--	1	1
Clínica Dr. Carlos Durán	4	--	--	1	1
Clínica Dr. Moreno Cañas	4	--	--	1	1
Clínica Dr. Marcial Fallas	4	--	--	1	1
Clínica de Puriscal	3	--	--	1	1
Clínica San Ignacio de Acosta	3	--	--	1	1
Clínica San Marcos de Tarrazú	2	--	--	1	1
Clínica Santa Elena	1	--	--	--	1
Clínica Santa María de Dota	1	--	--	1	1
Clínica La Lucha	1	--	--	--	1
Clínica Frailes	1	--	--	--	1
Clínica Turrubares	1	--	--	1	--
Clínica San Gabriel	1	--	--	1	1
CARTAGO PROVINCE					
Hospital Dr. Max Peralta	R	317	1	2	3
Hospital William Allen	P	120	1	3	3
Clínica La Unión	3	--	--	1	1
Clínica Paraíso	3	--	--	1	1
Clínica Juan Viñas	2	--	--	1	1
Clínica Pacayas	1	--	--	--	1
Clínica Cachí	1	--	--	--	1
Clínica Cot	1	--	--	--	1
Clínica Santa Cruz	1	--	--	--	1
PUNTARENAS PROVINCE					
Hospital Dr. Max Terán Valls, Quepos	P	53	1	1	1
Clínica Parrita	2	--	--	1	1
REGION HUETAR NORTE		146	2	4	10
ALAJUELA PROVINCE					
Hospital San Carlos	R	141	1	2	3
Hospital de Los Chiles	P	5	1	1	1
Clínica Aguas Zarcas	1	--	--	--	1
Clínica Pital	1	--	--	--	1
Clínica La Fortuna de San Carlos	1	--	--	1	1
Clínica Monterrey	1	--	--	--	1
Clínica Santa Rosa de Pocosol	1	--	--	--	1

Location	Type	# of Beds	Blood Bank	Ambu-lances	Other Vehicles
HEREDIA PROVINCE					
Clínica Río Cuarto	1	--	--	--	1
REGION CHOROTEGA		550	4	17	27
ALAJUELA PROVINCE					
Hospital Upala	P	20	1	1	2
GUANACASTE PROVINCE					
Hospital Dr. Enrique Baltodano	P	134	1	2	4
Hospital de La Anexión	P	105	1	2	2
Clínica Santa Cruz	3	--	--	1	1
Clínica Bagaces	2	--	--	--	1
Clínica Filadelfia	2	--	--	1	1
Clínica Cañas	2	--	--	1	1
Clínica Las Juntas de Abangares	2	--	--	1	1
Clínica La Cruz	2	--	--	1	1
Clínica Colonia Carmona, Nandayure	2	--	--	1	1
Clínica Hojancha	2	--	--	1	1
Clínica 27 de Abril	2	--	--	1	1
Clínica Nuevo Arenal	1	--	--	1	1
Clínica La Fortuna de Bagaces	1	--	--	--	1
Clínica Colorado de Abangares	1	--	--	--	1
PUNTARENAS PROVINCE					
Hospital Monseñor Sanabria	R	291	1	1	3
Clínica San Rafael	4	--	--	1	1
Clínica Esparza	2	--	--	--	1
Clínica Chomes	2	--	--	--	1
Clínica Jicaral	2	--	--	1	1
REGION HUETAR ATLANTICA		291	2	11	9
HEREDIA PROVINCE					
Clínica Río Frío	2	--	--	1	1
LIMÓN PROVINCE					
Hospital Dr. Tony Facio	R	207	1	3	1
Hospital Guápiles	P	84	1	2	1
Clínica Siquirres	3	--	--	1	1
Clínica La Fortuna	2	--	--	1	1
Clínica Cariari	2	--	--	1	1
Clínica Batán	2	--	--	1	1
Clínica Guácimo	2	--	--	--	1
Clínica Sixaola	2	--	--	1	1

Location	Type	# of Beds	Blood Bank	Ambu-lances	Other Venicles
REGION BRUNCA		401	5	9	17
SAN JOSÉ PROVINCE					
Hospital Dr. Escalante Pradilla	R	210	1	1	3
PUNTARENAS PROVINCE					
Hospital Dr. Tomás Casas	P	32	1	1	3
Hospital Golfito	P	75	1	1	4
Hospital San Vito	P	31	1	2	1
Hospital Ciudad Neily	P	53	1	2	2
Clínica Palmar Sur	3	--	--	1	1
Clínica Buenos Aires	3	--	--	--	1
Clínica La Cuesta	2	--	--	1	1
Clínica Puerto Jiménez	1	--	--	--	1

T O T A L S				
REGION CENTRAL (Meseta Central)	5,388	14	50	76
REGION HUETAR NORTE (Northern Lowlands)	146	2	4	10
REGION CHOROTEGA (Northwest)	550	4	17	27
REGION HUETAR ATLANTICA (Caribbean Coast)	291	2	11	9
REGION BRUNCA (Southwest)	401	5	9	17
	6,776	27	91	139

Source: CCSS (Caja Costarricense de Seguro Social). Anuario Estadistico: 1985 Costa Rica.

colono - squatter
cordillera - mountain range
esquilimo system - renters work land for a single harvest season
finca - plantation
golfo - gulf
Guardia Civil - Civil Guard
hidalgo - gentry
jefe politico - political boss
lago - lake
laguna - small lake
latifundios - large land holdings
mediera system - owner provides all but the labor
mestizo - mixed European and Indian ancestry
plebeyo - commoner
precarista - squatter
regidores - voting members of municipal council
río - river
sindicos - non voting members of municipal council
Tico - Costa Rican
valle - valley
volcán - volcano

Spanish	English
CASP - Centro para Analisis Socio-Politico	Center for Socio-Political Analysis
CCSS - Caja Costarricense de Seguro Social	Cost Rican Social Security Organization
CIGRAS - Centro para Investigaciones en Granos y Semillas	Grain and Seeds Research Center
CINDE - Coalición Costarricense de Iniciativas de Desarrollo	Costa Rican Coalition for Development Initiatives
CNP - Consejo Nacional de Producción	National Production Council
CODESA - Corporación Costarricense de Desarrollo	Costa Rican Development Corporation
CONESS - Comisión Nacional para Emergencias en el Sector de Salud	National Health Sector Emergency Commission
COMTELCA -	Central American Telecommuncations Organization
CONAPARE - Comité Nacional para Refugiados	Costa Rican National Refugee Commission
CRCR - Cruz Roja Costarricense	Costa Rican Red Cross
DGP - Dirección General Forestal	Costa Rican Forestry Service
DIGEPARE -	Costa Rican Refugee Directorate
DINADECO - Director Nacional de Desarrollo Comunal	Costa Rican Community Development Organization

FECOSA - Ferrocarrilles de Costa Rica	Costa Rican Railroads
FEP - Ferrocarril Eléctrico al Pacífico	Pacific Electric Railroad
FNA - Ferrocarril Nacional al Atlántico	National Atlantic Railroad
FVO - Federación de Organizaciones Voluntarias	Federation of Voluntary Organizations
ICE - Instituto Costarricense de Electricidad	Costa Rican Institute of Electricity
IDA -	National Agrarian Institute
IMAS -	Costa Rican Social Aid Institute
INCOP - Instituto Costarricense de Puertos del Pacífico	Costa Rican Institute of Pacific Ports
INISA - Instituto de Investigaciones en Salud	Institute of Health Research
INS - Instituto Nacional de Seguros	National Insurance Institute
ITCO - Instituto de Tierras y Colonización	Lands and Colonization Institute
JAPDEVA - Junta de Administración Portuaria y Desarrollo de la Veriente Atlántica	Council of Port Administration and Development of the Atlantic Shelf
LACSA - Lineas Aeras Costarricenses	Costa Rican Air Lines
MOPT - Ministerio de Obras Públicas y Transportación	Ministery of Public Works and Transportation
OPEN - Organización para Emergencias Nacionales	Organization for National Emergencies
PLN - Partido de Liberación Nacional	National Liberation Party
RECOPE - Refinadora Costarricense de Petroleo	Costa Rican Petroleum Refinery
RACSA - Radiografica Costarricense, S.A.	Costa Rican Radiography
SANSA - Servicios Aereas Nacionales	
SEPSA - Secretaria Ejecutiva de Planificación Sectorial de Desarrollo Agropecuario y de Recursos Naturales Renovables	Executive Secretary of Sectoral Planning for Agriculture, Livestock, and Natural Renewable Resources
UACA - Universidad Autónoma de Centra América	Autonomous University of Central America
UCR - Universidad de Costa Rica	University of Costa Rica
UNA - Universidad Nacional Autónoma	National Autonomous University
UNHCR -	United Nations High Commissioner for Refugees

Interviews
Conducted by Jane Kochman

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Paul Bell - OFDA Regional Adviser
Ricardo Bermudez - OFDA Regional Adviser
Jeff G. Boyer - Regional Housing Officer
Duane V. Deacon Jr. - Assistant Attaché, DOD
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Iris Maria Segura Sanchez - JAPDEVA (Port Authority)
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Ing. Luis Alberto Soto - Office of Rates and Consumption, Costa Rican Electric Institute (ICE)

PAHO

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Orlando Ramirez Sanchez - Executive Director, Costa Rican Red Cross (CRCR)
Rafael Vargas - Assistant Director, CRS

Other

Douglas Jewett - Dade County Fire and Rescue

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