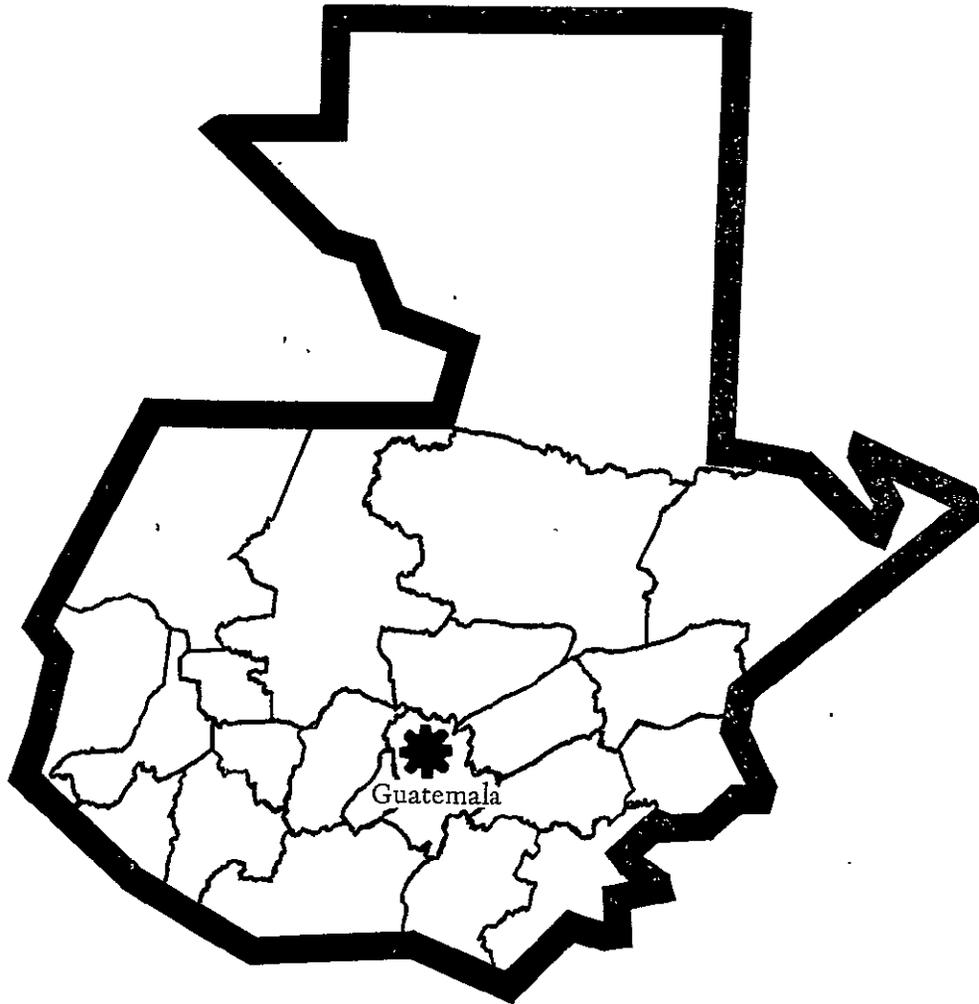


Guatemala

A Country Profile



June 1981

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

Guatemala



502473 1-76 (541403)
 Lambert Conformal Projection
 Standard parallels 9°20' and 14°40'
 Scale 1:2,800,000

Boundary representation is
 not necessarily authoritative

- Railroad
- Road
- ✈ Airport

GUATEMALA: A COUNTRY PROFILE

prepared for

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

by

Evaluation Technologies, Inc.
Arlington, Virginia
under contract AID/SOD/PDC-C-0283

The profile on Guatemala is one in 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). The content, scope, and sources have evolved over the course of the last three years, and no doubt will continue to do so. The relatively narrow focus is intentional. To avoid redundancy, some topics one might expect to find in a "country profile" are not covered here.

If the information provided can also be useful to others in the disaster assistance and development communities, so much the better. Every effort is made to obtain current, reliable data; unfortunately it is not possible to issue updates as fast as changes would warrant. A cautionary note, therefore, to the reader: statistics are indicators at best, and if names and numbers matter, the bibliography will point to a current source.

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

July 1981

OFDA COUNTRY PROFILES: APRIL 1981

AFRICA

Cape Verde
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Djibouti
East Africa Regional Profile
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1. General Information1.1 Geographic Codes

AID	520
State Region	ARA
FIPS	GT

1.2 Country Names

Legal	Republic of Guatemala
Short	Guatemala
Local	Republic de Guatemala

1.3 Calendar and Holidays

Independence Day	September 15
(Guatemala City only)	August 15
Columbus Day	October 12
Revolution Day	October 20
All Saints Day	November 1
Christmas	December 24 and 25
New Year's Day	January 1
Holy Thursday, Friday, Saturday and Sunday	Easter
Labor Day	May 1
Anniversary of the Revolution	June 30
Bank Employees Day (1975)	July 1

Fiscal year: January 1 to December 31

1.4 Currency (February 1981)

100 Centavos = 1 Quetzal
 1 US Dollar = 1.00 Quetzal

1.5 Time Zones

EST - 1; GMT - 6

1.6 US Mission to Guatemala (May 1981)

Address: Embassy of the United States
7-01 Avenida de la Reforma, Zone 10
APO Miami 34024
Phone: 31-15-41

Staff:

- AMB.....(Vacancy)
- CHG.....Melvin E. Sinn
- ECO.....David B. Timmins
- COM.....Robert W. Miller
- POL.....Arnold M. Isaacs
- LAB.....Raymond Gonzales
- CON.....Raymond M. Bailey
- ADM.....Walter M. Notheis
- RSO.....Willard Marsden, Jr.
- AGR.....Harry C. Bryan
- AID.....Eliseo Carrasco
- PAO.....Marie L. Telich

1.7 Host Country Mission and Staff in US (May 1981)

Chancery: 2220 R St. N.W.
Washington, D.C. 20008
Phone: 332-2865/2866

Staff:

- Ambassador.....Felipe Doroteo Monterroso
- Minister Counselor.....Norma J. Vasquez
- Defense, Military, Air,
and Naval Attache.....Colonel Mario Paiz-Bolanos
- Counselor for Commercial and
Technical Assistance....Dr. Cesar A. Orantes

1.8 Sister Cities

Antigua	Montclair, Ca.
	Prattville, Al.
Chichicastenango	Woodland Hills, Ca.
Coban	Birmingham, Al.
Cullapa	Huntsville, Al.
Escuintla	Montgomery, Al.
Guatemala City	Auburn, Al.
	Walnut Creek, Ca.
Jalapa	Demopolis, Al.
Jutiapa	Jasper, Al.
Puerto Barrios	Mobile, Al.
Quezaltenango	Livermore, Ca.
San Juan Sacatepequez	Wilmington, De.
Santa Lucia	Tuscaloosa, Al.
Solola	Guntersville, Al.
Zacapa	Selma, Al.

1.9 Treaties and Agreements

Agreements relating to cooperative efforts to protect crops and animals from diseases
 Treaty of peace, amity, commerce and navigation
 Military air transit agreement
 Agreements relating to defense
 General agreement for economic and technical cooperation
 Extradition treaty and supplementary convention
 Agreement relating to the construction of the inter-American highway and amendments
 Agreement regarding investment guaranties
 Agreement relating to the status of the Army and Air Force missions to Guatemala
 Peace Corps agreement
 Telecommunication agreement
 Agreements relating to trade and commerce
 Visas agreement

1.10 International Organization Memberships

CACM (Central American Common Market), FAO, G-77, IADB, IAEA, IBRD, ICAC, ICAO, ICO, IDA, IDB, IFC, IHO, ILO, IMF, ISO, ITU, IWC (International Wheat Council), OAS, ODECA, SELA, UN, UNESCO, UPEB, UPU, WHO, WMO.

1.11 Travel and Visa Information

Tourist card (\$1.00) valid for 6 months, and entry within 30 days of issue; obtained from consulate or airline serving Guatemala; requires personal appearance and identification (passport or birth certificate). Tourist/ business visa (no charge). Check Embassy/consulate for specific requirements.

No vaccinations are required; immunizations against hepatitis, typhoid and paratyphoid, typhus, polio, and tetanus are advisable for extended stays.

1.12 Ethnic and Sociocultural Groups

Two distinct ethnic types: Ladino and Indian; affiliation of individual depends more on cultural behavior than on physical type. Ladino racial make-up may vary from European through Mestizo to Indian, particularly in some rural areas; 1950 and 1964 censuses designated as Ladino all people not culturally Indian, including Blacks and Asians. Ladino culture is Hispanic; Spanish is also the primary language. Well-defined class structure is based on descent and wealth; western family (nuclear) and community structure, religious observance (secular Catholicism), and mass-produced goods are preferred. The welfare of the individual is emphasized over that of the community. Urban orientation: occupations fall into commercial, service, semi-professional, and professional categories.

In contrast, Indian social structure is based on the extended family and, in many highland communities, a system of religious brotherhoods, or *cofradías*. Individual status depends on age and prestige earned through contributions to the community. Spanish is spoken as a second language by most men and some women, but local Indian language is used in the home.

Subsistence or small scale, market-oriented farming (supplemented by handicrafts) is the main source of income; the extended family is the basic economic unit. Agricultural day-labor provides additional income for some Indians; for the poorest, it is the primary occupation. Seasonal migration to work commercial farms of the south coast is increasing; an estimated 500,000 laborers, most from the western highlands, are employed there.

43% of the population is classed as Indian (or, preferably, indigenous) who live in small rural villages. Indians predominate in the western and central highlands, Ladinos in the capital area, the eastern desert, and on the Caribbean and south (Pacific) coasts. Ladino elites traditionally control economic, social, and religious affairs, though the coming

of township government elections has diminished their local political power. Ladinization and migration to urban areas, and adoption of Spanish language and culture by many Indians, has been increasing in recent years and has provided the primary route for upward mobility for Indians.

Small numbers of Blacks and Carib Indians, whose cultural affinities are with the West Indies rather than Central America, live in the Atlantic coastal areas.

1.13 Languages

Spanish, the official language, is used in government, education, and commerce. Twelve to twenty indigenous languages and/or dialects, most belonging to the Maya language family, are the primary languages of unacculturated Indians. Relative isolation of Indian groups has perpetuated significant differences in local languages and customs.

1.14 Education

Two-thirds of rural 7 to 14 year-old children do not attend school. 90% of the 7 to 14 year-old children in the Highlands receive no formal education. Nationwide, only 12% of all 15 to 20 year-olds attend high school or vocational school.

The overall literacy rate is about 50% but recent surveys indicate that as much as 82% of the population of indigenous origin may be illiterate; literacy in rural areas, 31%, is less than half that in cities, 70%. Indian men are often fluent (though illiterate) in Spanish; Indian women and children markedly less so.

1.15 Religions

90% of the population is Roman Catholic. Ladino Catholicism conforms to the Spanish model but Indian rites combine Catholic and Mayan elements. Christian deities and saints are identified with and assume the attributes of their Mayan counterparts; pre-Columbian rituals have been adapted to include appropriate saints. Religious brotherhoods (cofradías) are important in the community as well as in the activities of most Mayan groups.

Protestant sects include: Assemblies of God, Central American Mission, Evangelical Presbyterian Church, Church of God, Friends, Church of the Nazarene, and Southern Baptist Convention.

2. Government

2.1 National Government

Political power is traditionally personal rather than institutional. The 1965 constitution that established a unitary republic is still in effect. A resident, elected to a 4-year non-renewable term by direct vote, names and presides over the council of ministers, and is Commander-in-Chief of the armed forces. Successful presidential candidates are often backed by the military; fraud is not unknown in presidential elections. The unicameral legislature consists of 60 members who also serve 4-year non-renewable terms. Supreme court judges, themselves selected by the congress, name lower court judges.

2.2 Regional Organization

The 22 administrative departments are headed by governors appointed by the president. Departments are divided into 326 municipalities under elected mayors.

2.3 Major Government Figures (June 1981)

President.....	Lucas Garcia, Fernando Romeo, Maj. Gen.
Vice President.....	Mendoza Azurdia, Oscar, Col. (Ret.)
Min. of Agriculture.....	Bobadilla Paloma, Francisco
Min. of Communications & Public Works.....	Estrada Mayorga, Carlos
Min. of Economy.....	Solorzano Fernandez, Valentin
Min. of Finance.....	Belteton San Jose, Arnoldo
Min. of Foreign Relations.....	Castillo Valdez, Rafael Eduardo
Min. of Government & Interior...	Alvarez Ruiz, Donald
Min. of Labor & Social Planning.....	Alarcon Monsanto, Carlos
Min. of Natl. Defense.....	Guevara Rodriguez, Angel Anibal, Brig. Gen.
Min. of Public Education.....	Castillo Coronado, Clementino, Col.
Min. of Public Health & Social Assistance:.....	Recinos Mendez, Roquelino, Dr.

2.4 1980 Status

Evidence of erosion of the traditional power structure is seen in the failure of the extreme Right to control the outcome of the 1978 elections as well as in escalating terrorism. Assassination of leading political figures of both Right and Left was becoming commonplace by mid-1978. Right-wing paramilitary groups, supported by some sectors of the army, have killed labor and left-wing opposition leaders in hopes of crushing the so-called Guerrilla Army of the Poor (EGP), active in the Western Northern transversal strip. Moderate Vice-President Francisco Villiigran Kramer resigned in September 1980 in protest over the regime's violations of human rights.

Any compromise between extremist factions seems unlikely in present political climate. The National Liberation Movement (MLN) is the dominant right-wing party; the Revolutionary Organization of People in Arms (ORPA) is another left-wing group.

3. Disaster Preparedness

3.1 Host Disaster Plan

The National Emergency Committee is located at the airport (tel. 62003; 62716). The Minister of National Defense chairs the Emergency Committee and appoints a General Coordinator who is responsible for all emergency relief distribution and for direction of all National and International Volags. Standard procedure is followed: advanced warning, refuge for victims, communications, evacuation, restoration of services, administration of relief.

General Coordinator: Gen. Guillermo Echeverria Vielman
Sub-Coordinator: Capt. Mauro Jose Humberto Fuentes Soria
Office Tel: 62003
Home Tel: 41133

3.2 US Plan

The Ambassador is the principal liaison between USG and GOG; he determines extent and time of USG relief activities after formal request for AID from GOG. The USAID Director, with support of MDRO and U.S. team, directs and mobilizes USAID disaster activities. A disaster relief operations center will be established at the embassy or airport; it dispatches field inspectors for latest information and uses any available U.S. military resources.

3.3 US Team

MDRO: Richard D. McLaughlin Alternate MDRO: Thomas W. Stukel
Chief of Mission: Ambassador (Vacancy)
Mission Director: Eliseo Carrasco

G. Transportation and Logistics, Fuel, Supplies and Distribution

H. Rescue and Relief Assessments/Operations

I. Coordination Activities

J. Security

K. Monitoring Overall Activity

L. Administrative and ReportingM. InformationN. Clerical and Typing3.4 Contact List

Red Cross: Along with Guatemala military the RC will carry out its usual relief duties: refugee centers, food distribution etc. Guatemalan Red Cross: 3A Calle 8-40, Zona 1, Guatemala. Cable: GUATECRUZ, Guatemala. Tel: 24648.

Information on the following can be obtained from USAID Disaster Relief Plan, FY 1978, Vol. One: Salvation Army, Seventh Day Adventists, CEMEC, World Vision, Care, YMCA, Penny Foundation, Medical Assistance Programs, Church World Service, OXFAM.

Other Contacts

Caritas; Ciudad de Guatemala, 11 Avda. No. 31-86, Guatemala. Cable: GUATECARITAS, Guatemala. Tel: 606-24.

CRS: 11 Avenida 31-86, Zona 5, Apartado Postal 739, Guatemala City. Cable: CATHWEL, Guatemala. Telex: 245 Estamas GU. Tel: 65615

WCC: Junta Evangelica de Servicio Social y Cultural, Apartado 904, Guatemala City. Tel: 84953

3.5 International Organizations

UNDP: Edificio el Triangulo, Nivel 15, 7A, Avenida 6-53, Zona 4, Guatemala. Cable: UNDEVPRO, Guatemala. TELEX: U18, UNDP, GU. Tel: 62033

OAS: 3A Cable 5-43, Zona 9, Guatemala City. Tel: 65095.

UNESCO: 3A, Avenida 13-28, Zona 1, Guatemala City. Tel: 82669;534786.

UNICEF: 8A Avenida 17-32, Zona 1 Edificio el Cielito, Apt. 214, Guatemala City. Tel: 25118; 537055; 22253.

FAO: 7A Avenida 6-53, Zona 4, Edificio el Triangulo. Tel: 310597.

PAHO/WHO: 12 Calle 6-15, Zona 9, Guatemala City. Tel: 310980

Rockefeller Foundation: 5A Avenida 12-31, Zona 9, Guatemala City. Tel: 310863.

3.6 Host Resources

GOG needs assistance with disasters of great magnitude. Food resources: the country is generally self-sufficient in corn, beans, and rice.

Medical Resources

<u>Hospital/Location</u>	<u># Beds</u>
General Hospital 9A. Calle 7-56, Zona 9	546
Hospital for Obstetrics and Gynecology 7A. Avenida 8-67, Zone 9	325
Orthopedic Hospital Diagonal 12, 0-23, Zone 9	319
Rehabilitation Hospital 14 Avenida and 4th Calle, Zone 12	302

Out-Patient Departments

Hospital for Pulmonary Diseases
Finca "La Verbena", Zone 7

60

Polyclinic
7a. Avenida y 17 Calle, Zone 1

Clinic, Zone 5
27 Calle 13-26, Zone 5

Clinic, Zone 6
19 Avenida 7-14, Zone 6

Clinic, Zone 11
9A. Calle y 9A. Avenida, Zone 11
Villa Canales, Villa Canales

First Aid Posts

Palencia

Frajanes

Finca "Santa Leonarda", Villa Canales

San Juan Sacatepequez

Departmental Facilities

<u>Department</u>	<u>Location</u>	<u># Beds</u>
Chimaltenango	Chimaltenango	10
Chimaltenango	Pochuta	12
Escuintla	Escuintla	150
Escuintla	Sta. Lucia Cotzumalguapa	28
Escuintla	Tiquisate	17
Santa Rosa	Cuilapa	13

<u>Department</u>	<u>Location</u>	<u># of Beds</u>
Quezaltenango	Quezaltenango	56
Quezaltenango	Colomba	40
Quezaltenango	Coatepeque	60
Suchitepequez	Mazatenango	59
Suchitepequez	Chicacao	13
Suchitepequez	Patulul	19
Retalhuleu	Retalhuleu	76
San Marcos	El Tumbador	30
San Marcos	Malacatan	33
Huehuetenango	Huehuetenango	12
Alta Verapaz	Coban	40
Zacapa	Zacapa	20
Izabal	Puerto Barrios	30
Chiquimula	Chiquimula	13

Out-Patient Departments

Sacatepequez	Antigua Guatemala
Escuintla	La Gomera
Escuintla	Puerto San Jose
Retalhuleu	Champerico
San Marcos	Tecun Uman
Baja Verapaz	Salama
Izabal	Morales

Out-Patient Departments

Jalapa	Jalapa
Jutiapa	Jutiapa

These are the private hospitals, with the number of beds (where information was available):

<u>Hospital/Location</u>	<u># Beds</u>
<u>Guatemala City</u>	
Hospital Centro Medico 6A. Avenida 3-47, Zona 10 65061/3	79
Hospital Colonia China 2A. Calle "A" 13-59, Zona 6 881057	N.A.
Hospital De Dia. Ave. La Reforma 3-43, Zona 10 64487	N.A.
Hospital De Dia Itzamna Calz. Roosevelt 35-98, Zona 7 41829	N.A.
Hospital de Ojos y Oidos "Dr. Rodolfo Robles" Diagonal 21 y 19 Calle, Zona 11 460275	N.A.
Hospital Herreral Lerandi 6A. Avenida 8-71, Zona 10 66771-5	80
Hospital Instituto Rossell 16 Calle 5-86, Zona 10 680757	5

Hospital Latino Americano 7A. Avenida "A" 7-50, Zona 2 24401-3	33
Hospital Los Arcos 6A. Avenida 20-88, Zona 10 682143	N.A.
Hospital Militar 6A. Avenida Entre 4A. y 6A. Calles, Zona 10 62991; 310301	N.A.
Hospital Privado 10A. Calle 1-52, Zona 1 22739	N.A.
Hospital Privado Bella Aurora 10A. Calle 2-31, Zona 14 681951-5	62
Hospital San Pedro 28 Calle 25-28, Zona 5 67514	N.A.
Sanatorio Espanol 4A. Avenida 14-64, Zona 1 28706	17
Sanatorio Hermano Pedro 17 Avenida 23-49, Zona 11 481084	67
Sanatorio Privado San Lazaro Calle Marti 11-35, Zona 2 882433	12
Sanatorio Rodriguez Montoya 13 Calle 11-58, Zona 1 83878	8
Sanatorio San Pablo Via 5, 7-47, Zona 4 63861	13

Quezaltenango

Casa De Salud Hospital Privado
6A. Calle 13-42, Zona 1
061-2254

N.A.

Hospital Privado Quezaltenango
Calle Rodolfo Robles 23-51, Zona 1
061-4382

N.A.

Hospital Rodolfo Robles
Diagonal 11, Zona 1
061-4229

N.A.

Also in Guatemala City, the Military Hospital at 6A. Avenida 4-50, Zona 10 has 236 beds, and the Police Hospital, at 11 Avenida 4-49, Zona 1, has 80 beds.

First Aid Posts:

<u>Location</u>	<u>Municipality/Department</u>
El Rancho	San Agustin Acasaguastlan El Progreso
Yepocapa	Yepocapa Chimaltenango
Finca Tacana Zunil	Tiquisate Escuintla
Finca Pangola	La Gomera, Escuintla
Palin	Palin Escuintla
Barberena	Santa Rosa
Chiquimulilla	Chiquimulilla Santa Rosa

Nuevo Vinas	Nuevo Vinas Santa Rosa
San Luca Toliman	San Lucas Toliman Solola
San Felipe	San Felipe Retalhuleu
San Rafael Pie	San Rafael Pie San Marcos
Nuevo Progreso	Nuevo Progreso San Marcos
El Quetzal	El Quetzal San Marcos
La Reforma	La Reforma San Marcos
San Ildefonso Ixtahuacan	San Ildefonso Ixtahuacan Huehuetenango
La Democracia	La Democracia Huehuetenango
Santa Cruz Barillas	Santa Cruz Barillas Huehuetenango
San Juan Cotzal	San Juan Cotzal El Quiche
La Tinta	Panzos Alta Verapaz
Senahu	Senahu Alta Verapaz
Santa Maria Cahabon	Santa Maria Cahabon Alta Verapaz
Livingston	Livingston Izabal

El Estor	El Estor Izabal
Gualan	Gualan Zacapa

Pharmaceutical Laboratories

<u>Name</u>	<u>Street Address and Phone No.</u>
Abbott Laboratorios	Carr. Roosevelt Km. 14, Zona 7 490113
Agencias J.I. Cohen	13 Calle 3-24, Zona 1 20895
Amicelco	5A. Avenida 4-12, Zona 1 83581
Boehringer Ingelheim	La. Calle 7-21, Zona 9 62826
Parke Davis	Carr. Roosevelt Km. 14 1/2. Zona 7 490689
Cia. Farmaceutica Upjohn	Carr. Roosevelt Km. 14 1/2, Zona 11 490010
Ciba Geigy Ltda.	La. Calle 7-21, Zona 9 61629
Cyanamid Inter- American Corp.	11 Calle 8-14, Zona 1 26738
Disfarca	4A. Calle 9-57, Zona 1 20641
Eli Lilly de C.A.	Km. 15 Carr. Roosevelt, Zona 11 490413
Industria Farmaceutica Infasa	Carr. Roosevelt Km. 15 1/2, Zona 11 490814
Inprofar	2A. Calle 34-92, Zona 7 42127

Johnson and Johnson De Centroamerica	Carr. Roosevelt 35-25, Zona 11 42070
Lab. Farmaceutico Squibb, S.A.	Carr. Amatitlan Km. 11 1/2, Zona 12 460511
Laboratorios Bonin	Avenida Elena 14-28, Zona 3 24139
Labs. Alfredo Herbruger, Jr.	Carr. Roosevelt Km. 14, Zona 7 490122
Laboratorios Farmaceu- ticos Vizcaino	13 Calle 4-74, Zona 1 25429
Laboratorios Farte	12 Avenida 28-84, Zona 5 61926
Laboratorios Frycia	Ave. Petapa 15-77, Zona 12 480042
Laboratorios ICA	10A. Calle Interior Finca El Zapote 681121
Laboratorios Lacer	11 Calle 8-06, Zona 1 25982
Laboratorios Lafco	Carr. Roosevelt 24-58, Zona 7 40662
Laboratorios Laprin	12 Calle 14-01, Zona 1 28442
Laboratorios Laprofa	Carr. Roosevelt Km. 14 1/2, Zona 7 490110
Laboratorios Quifarma	15 Calle 19-00, Zona 12 480711
Laboratorios Somar	22 Calle 34-30, Zona 5 871542
Laboratorios Tejada	11 Avenida 19-44, Zona 10 682225

Lancasco	Km. 5 1/2 Ruta Al Atlantico, Zona 18 881687
McKesson	8A. Calle 2-47, Zona 1 24818
Merck Centroamericana	Carr. Roosevelt Km. 13 1/2, Zona 11 490616
Pharmakon	36 Calle "A" 3-40, Zona 8 41464
Plough Export Inc.	Carr. Roosevelt Km. 14 1/2, Zona 11 490984
Química Hoechst	Carr. Roosevelt Km. 15 1/2 490011
Richardson-Merrell	3A. Avenida 10-08, Zona 13 63238
Roussel Centroamericana	3A. Avenida y 7A. Calle, Zona 2 86850
Sante De Guatemala	13 Avenida 4-27, Zona 1 880614
Schering Corporation	Ave. Reforma 15-54, Zona 9 62893
Unipharm	16 Calle 3-46, Zona 1 29924

In case of a disaster, temporary medical facilities could be established in the following locations in Guatemala City:

Ciudad Universitaria	Zone 12
Aurora Jockey Club	Zone 13
Ciudad Olímpica	Zone 5
Parque Centroamerica	Zone 9
Guatemala Country Club	Zone 11
Colonia Roosevelt	Zone 11

Parque Minerva	Zone 2
Campo De Marte	Zones 5 and 10
Aeropuerto Interna- cional "La Aurora"	Zone 13

Transportation and Logistics Resources

Trucks

A list of commercial trucking firms, with phone numbers and addresses, follows:

<u>Name</u>	<u>Address and Phone No.</u>
Transportes Centro- Americanos Relampago	6A. Avenida 2-13, Zona 13 66100
Transportes Mony King	6A. Avenida 2-43, Zona 9 480070
Transportes Avila	Calzada San Juan 31-53, Zona 7 86046
Transportes Rodriguez	14 Avenida 11-71, Zona 11 44700
Transportes Guatemala	Calle Mariscal 14-38, Zona 11 481011
Transportes San Judas	10A. Avenida 6-45, Zona 11 891323
Transportes Lainfiesta	4A. Avenida 13-12, Zona 1 22251
Transportes Porras Arana	Zaragoza, Chimaltenango
Transportes Arias	34 Avenida 21-28, Zona 5 871376
Transportes Asociados	8A. Avenida 38-37, Zona 3 40327

Transportes Transvita	6A. Avenida 14-84, Zona 9 62743
Transportes Diaz Avila	Calle Mariscal 11-17, Zona 11 481896
Transportes Atlas	Ave. La Reforma 3-48, Zona 9 66953
Transportes Morales	10A. Avenida 13-29, Zona 7 Colonia Castillo Lara

Heavy Equipment

1. The Ministry of Communications and Public Works, Direccion General de Caminos, operates a substantial amount of heavy equipment. It is headed by Ing. Rodolfo Rubio, Finca la Aurora, Zona 13, Telephone 310408.

2. The three Guatemalan Army Engineer Units are as follows:

<u>Name</u>	<u>Location</u>	<u>Primary Mission</u>
1st Engineer Co.	Modesto Mendez	Work on road from Modesto Mendez to Alta Verapaz
2nd Engineer Co.	Chahal (Alta Verapaz)	Work on road from Alta Verapaz to Modesto Mendez
3rd Engineer Co.	Chinchila (El Peten)	Work on roads in the Peten

Boats

In addition to private craft, the following boats are in the possession of the Guatemalan Navy:

2	36-footers)	Patrol Boats
2	40-footers)	
5	65-footers)	
1	63-footer)	

2	85-footers)	
			Patrol Boats
1	105-footer)	
1	LCM-6		
$\frac{1}{15}$	floating workshop		

Military Aircraft

Following is a list of aircraft in the Guatemalan Air Force:

- 13 Jets (11 A-37 fighters; 2 5-33 Trainers)
- 10 Turboprop (Transports - 9 Aravas; 1 C-12 Super King Air)
- 22 Prop (12 transports - 1 DC-6B, 11 C-47's; 4 utility - 3 Cessna 206's, 1 Cessna 180; 6 trainers - Cessna 172)
- 14 Helicopters (9 UH-1, 3 Alouette III, 2 Lamas)

Construction Resources/Local Building Contractors

Name

Jose R. Castaneda	6A. Ave. "A" 35-44, Zona 11 481300
Jorge M. Chavez	18 Calle 3-25, Zona 14 683311
Iturbide, Toruno y Ica. Ltda.	6A. Avenida 3-44, Zona 9 64132; 65276
Alvarez, Roesch, Toledo, S.A.	3A. Calle 0-55, Zona 2 28055

Further coordination may be provided by the Asociacion Guatemalteca de Contratistas de las Construcciones, 10A. Calle 7-70, Zona 9, Telephone No. 63943.

Building Supplies

1. Roofing

Productos Duralita, S.A.	15 Avenida 16-12, Zona 6 880094
Distun	20 Calle 7-62, Zona 1 81381-4
Galcasa	Ave. La Reforma 3-48, Zona 9 62986; 67263; 62987; 67270
Ferreteria Sayet	2A. Calle 6-30, Zona 9 62222; 65846-7; 62414
Casa Prem	4A. Avenida 17-55, Zona 1 83641-4

2. Cement

Cemento Novella, S.A.	15 Avenida 18-01, Zona 6 880091-3; 881412
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3. Lumber

Aserradero Italiano	21 Calle 11-01, Zona 1 26711
Aserradero Masselli	19 Calle 2-42, Zona 1 20925
Aserradero Las Victorias	18 Calle 1-60, Zona 1 21305
Santa Margarita	3A. Calle 11-60, Zona 6 880922
Aserradero La Hermita	18 Avenida 2-40, Zona 6 880814
Los Alamos	Km. 3, Carr. Al Atlantico 880362
Aserradero Santa Ana	Ave. Bolivar 27-72, Zona 3 44149

Aserradero Arathoon	Ave. Bolívar 32-62, Zona 3 43261
Aserradero La Casita	31 Calle "A" 2-39, Zona 8 40551
Aserradero Sinai	Calz. San Juan 10-06, Zona 7 43809
Aserradero La Union	Calz. San Juan 12-02, Zona 7 40830
Aserradero San Martin	16 Calle 32-76, Zona 7 44594
Aserradero El Trebol	La. Avenida 1-61, Zona 11 45023
El Esfuerzo	Calz. Aguilar Batres 3-57, Zona 1 41804
Aserradero Fagiani Hnos.	15 Avenida 6-12, Zona 6 880290
Aserradero Vasconia	Calz. Aguilar Batres 34-77, Zona 12, 480403
Asserradero Garin	LA. Avenida 1-23, Zona 13 310828

3.7 US Volags

<u>Agency</u>	<u>Personnel Intl/Local</u>	<u>Programs</u>
Agricultural Cooperative Development International	1/0	Coops & Loans; Food, Prod & Ag
American Dentists for Foreign Service	0	Equip & Mat Aid; Med & Ph
AFL-CIO, American Institute for Free Labor Development	2/0	CD
American National Red Cross	NA	CHP; Equip & Mat Aid

<u>Agency</u>	<u>Personnel Intl/Local</u>	<u>Programs</u>
AMG International	7+/2+	Ed; Equip & Mat Aid; Food Prod & Ag; Med & Ph; Nutr
Assemblies of God	2+/0	CHP; Equip & Mat Aid
Baptist World Relief	0	CHP; Equip & Mat Aid; Med & Ph
Benedictine Sisters	6/0	Comm; CD; Ed; Equip & Mat Aid; Women
Brother's Brother Foundation	8/50	CHP; Equip & Mat Aid; Food Prod & Ag; Med & Ph
The Carr Foundation	0	Comm; Med & Ph
CARE, Inc.	5/36	CHP; Ed; Equip & Mat Aid; Food Prod & Ag; Med & Ph; Nutr; Pop & Fam Serv
Catholic Medical Mission Board	0	Equip & Mat Aid; Med & Ph
Catholic Relief Services - U.S.C.C.	3/7	Comm; CD; CHP; Coops & Loans; Ed; Equip & Mat Aid; Food Prod & Ag; Med & Ph; Nutr
Central American Mission	22/0	Comm; Ed; Med & Ph
Christian Brothers, Brothers of the Christian Schools	10/65	Ed
Christian Children's Fund, Inc.	0/289	CHP; Ed; Med & Ph; SW
Christian Nationals' Evangelism Commission, Inc.	0/25	Ed; Equip & Mat Aid; Med & Ph
Christian Reformed World Relief Committee	5/NA	CHP; Equip & Mat Aid; Med & Ph; Nutr

<u>Agency</u>	<u>Personnel Int'l/Local</u>	<u>Programs</u>
Church World Service	2/2	CD; CHP; Coops & Loans
Darien Book Aid Plan, Inc.	0	Equip & Mat Aid
Direct Relief Foundation	21/0	Equip & Mat Aid; Med & Ph
Eastern Mennonite Board of Missions and Charities	5/0	CD; CHP; Food Prod & Ag; Med & Ph
The Episcopal Church of the U.S.	1/9	CD; Ed; Med & Ph; Youth
The Ford Foundation	0	Ed; Med & Ph; Nutr
Franciscan Fathers, Franciscan Missionary Union	13/50	Ed; Med & Ph; Nutr
Heifer Project International	NA	Food Prod & Agr
Helen Keller International, Inc.	NA	CHP; Equip & Mat Aid
Interchurch Medical Assistance, Inc.	0	Equip & Mat Aid; Med & Ph
International Educational Development	0	CHP; Ed; Equip & Mat Aid
International Executive Service Corps	NA	Pub & Bus Admin
International Institute of Rural Reconstruction, Inc.	0/10	Coops & Loans; Ed; Food Prod & Agr; Med & Ph
W. K. Kellogg Foundation	0	Med & Ph
Lutheran Church - Missouri Synod	5/NA	CHP; Coops & Loans
Lutheran Medical Mission Association	0	Equip & Mat Aid; Med & Ph
Lutheran World Relief	NA	CD; Chp; Equip & Mat Aid; Med & Ph

<u>Agency</u>	<u>Personnel Intl/Local</u>	<u>Programs</u>
Map International	NA	CHP; Equip & Mat Aid; Med & Ph
Maryknoll Fathers	50/NA	Comm; CD; CHP; Coops & Loans; Ed; Equip & Mat Aid; Food Prod & Ag; Med & Ph; Nutr; SW; Youth
Maryknoll Sisters of St. Dominic	29/NA	CD; CHP; Ed; Equip & Mat Aid; Med & Ph; SW; Women; Youth
Meals for Millions Foundation	0	Ed; Nutr
Medical and Surgical Relief Committee	0	Equip & Mat Aid; Med & Ph
Mennonite Central Committee	25/NA	CHP; Equip & Mat Aid
Mennonite Economic Development Association	0	Coops & Loans; Ind Dev
National 4-H Foundation of America	0/NA	Ed; Youth
Oxfam-America	NA	CHP
Pan American Development Foundation	0	Coop & Loans; Ed; Equip & Mat Aid; Med & Ph
The Pathfinder Fund	0	Med & Ph; Pop & Fam. Serv
People-to-People Health Foundation (Project Hope)	4/0	Equip & Mat Aid
Primitive Methodist Church, U.S.A.	16/25	CHP; Ed; Food Prod & Ag; Med & Ph
Project Concern	5/40	Med & Ph; Nutr
Research Corporation	0	Med & Ph; Nutr
The Rockefeller Foundation	0	Food Prod & Ag; Med & Ph; Nutr

<u>Agency</u>	<u>Personnel Int'l/Local</u>	<u>Programs</u>
Salesians of St. John Bosco	61/7	CHP; Ed; Med & Ph; Sw; Youth
The Salvation Army	NA	CHP; Ed; Equip & Mat Aid; SW
Save the Children Federation/ Community Development Foundation	9/18	CD; CHP; Equip & Mat Aid
Seventh-Day Adventist World Service	NA	CHP; Med & Ph
Sisters of Charity of The Incarnate Word	4/NA	Med & Ph
Southern Baptist Convention Foreign Mission Board	19/14+	Ed; Equip & Mat Aid; Med & Ph
Summer Institute of Linguistics	78/0	CHP; Ed; Equip & Mat Aid
United Church Board for World Ministries	0	Food Prod & Ag
United Methodist Committee on Relief	0	CD; CHP; Coops & Loans; Ed; Equip & Mat Aid; Food Prod & Ag; Med & Ph; SW
World Neighbors	5/80	CD; CHP; Coops & Loans; Food Prod & Ag; Med & Ph; Nutr; Pop & Fam Serv; SW
World Rehabilitation Fund	0	Ed; Med & Ph
World Relief Commission of the National Association of Evangelicals	0	Equip & Mat Aid
World University Service	NA	CHP; Ed; Equip & Mat Aid; Med & Ph
World Vision Relief Organization	1/9	CD; CHP; SW

<u>Agency</u>	<u>Personnel Intl/Local</u>	<u>Programs</u>
Y.M.C.A. of the U.S.	0	SW; Youth

Key

Comm.	Communications
CD	Community Development
CHP	Construction, Housing and Planning
Coops & Loans	Cooperatives, Credit Unions & Loans
Ed	Education
Equip & Mat Aid	Equipment and Material Aid
Food Prod & Ag	Food Production & Agriculture
Ind Dev	Industrial Development
Med & Ph	Medicine & Public Health
Nutr	Nutrition
Pop & Fam Serv	Population & Family Services
Pub & Bus Adm	Public & Business Administration
SW	Social Welfare
Women	Women
Youth	Youth

3.8 Disaster Types and History

Major Disasters: Earthquakes and Floods

Earthquakes have been reported since the beginning of contact with Europeans. Guatemala City and the old capital of Antigua have been severely damaged by earthquakes more than 15 times since the early 16th century. The epicenter of the latest quake in the Montagua River Valley was within the least active of 3 seismic zones; it was ironic in that it produced the most destructive quake in recent Guatemala history. Figures for total destruction by the February 1976 quake: 22,868 killed, 1.07 million homeless, 254,000 houses destroyed, \$1.1 billion in damages. Guatemala City rated average intensity. Damages: 1,200 killed, 45% destroyed. Area of greatest shaking: W. Guatemala.

Thousands of landslides (secondary effects of the shock) and blocked roads cut surface communications throughout central Guatemala. Major slides formed dams, bringing added danger of flooding from these accidental lakes and rivers.

4. Population

4.1 National Population

With one of the world's highest annual growth rates at about 3% per year, the Guatemalan population has doubled every 37 years between 1778 and 1950. Estimated 1977 population of 6.6 million included 1.5 million in Guatemala City metro area, 1.3 million women of child-bearing age (14-44), and 2.9 million under age 15. 1980 population was estimated at 6,954,000.

Until recently, family planning services have been carried out almost entirely by APROFAM, the local IPPF affiliate. The GOG has reversed its stance on disassociation from family planning activities, however, and the Ministry of Health now officially sanctions the delivery of family planning services through existing health facilities.

Of the population officially classified rural, 80% are concentrated in three areas: Western Highlands (42%), South Coast (22%), and Eastern desert (15%). The rest are distributed among Central Highlands, Capital Metro area, Atlantic Coast, and El Peten at 11%, 5%, 4%, and 1% respectively. However, census is complicated by seasonal employment, primarily on fincas in the agricultural South Coast, where as many as 500,000 workers are employed, attracting 1,500,000 dependents.

Population densities as of 1976: 59.7/sq. km., and 142.9/sq.km. on arable land. Densities by region: Capital Metro Area, 250/sq. km.; Western Highlands, 169/sq. km.*; Eastern Desert, 50/sq. km.; Central Highlands, 33/sq. km.; South Coast, 31/sq. km.; Atlantic/Caribbean, 15/sq. km.; and El Peten, less than 5/sq. km.

* Haiti's population density, highest in Latin America, is 165/sq. km.

4.2 Regional Population

Population by Region and Department (Total/Urban/Rural)

<u>Department</u> *	(Thousands of Persons)			
	<u>1950</u>	<u>1964</u>	<u>1977</u>	<u>1985</u>
Highlands (Altiplano)	1,481.9	2,192.1	3,297.7	4,241.3
Chimaltenango	132.2	168.6	231.6	271.0

<u>Department</u> *	(Thousands of Persons)			
	<u>1950</u>	<u>1964</u>	<u>1977</u>	<u>1985</u>
Guatemala	477.6	843.1	1,396.0	1,958.2
Huehuetenango	217.7	299.0	444.0	557.2
Quezaltenango	200.4	280.1	383.3	457.3
Quiché	190.3	259.5	366.8	440.6
Sacatepequez	65.4	83.1	117.7	141.7
Solola	90.2	111.5	152.3	173.7
Totonicapan	108.1	147.2	206.0	241.6
South (Sur)	866.7	1,309.8	1,799.2	2,218.6
Escuintla	134.7	280.0	392.6	540.1
Jutiapa	151.2	202.0	284.7	332.0
Retalhuleu	72.8	121.8	169.5	218.6
San Marcos	253.1	350.0	474.5	562.9
Santa Rosa	119.5	162.8	217.8	251.1
Suchitepequez	135.4	193.2	260.1	313.9
East (Oriente)	392.2	546.7	783.1	939.2
Chiquimula	122.8	155.3	194.8	210.1
Izabal	59.9	120.8	225.0	315.2
Jalapa	81.8	102.7	142.4	164.1
Progreso	52.1	67.9	89.0	101.3
Zacapa	75.7	100.0	131.9	148.5
North (Norte)	278.7	370.7	477.7	530.2
Alta Verapaz	206.5	270.6	344.9	376.8
Baja Verapaz	72.2	100.1	132.8	153.4
Peten	17.3	27.4	78.2	112.8
Total	3,036.9	4,446.7	6,435.9	8,042.1
Highlands (Altiplano) **	18.1	23.0	26.4	29.2
Chimaltenango	1.4	1.4	1.4	1.3
Guatemala	11.4	14.8	17.7	20.4
Huehuetenango	0.5	1.1	1.2	1.2
Quezaltenango	1.5	2.2	2.4	2.5
Quiché	0.6	0.8	0.8	0.8
Sacatepequez	1.3	1.3	1.4	1.4
Solola	0.6	0.9	1.0	1.0
Totonicapan	0.6	0.5	0.5	0.6
South (Sur)	3.8	5.9	6.8	7.8
Escuintla	0.9	1.5	2.0	2.7
Jutiapa	0.5	0.8	1.0	1.0

Department	(Thousands of Persons)			
	1950	1964	1977	1985
Retalhuleu	0.5	0.7	0.8	1.0
San Marcos	0.5	0.9	1.0	1.0
Santa Rosa	0.5	0.7	0.7	0.7
Suchitepequez	0.8	1.2	1.3	1.4
East (Oriente)	2.4	3.2	3.2	3.0
Chiquimula	0.4	0.7	0.7	0.6
Izabal	0.8	0.8	0.8	0.8
Jalapa	0.5	0.6	0.6	0.6
Progreso	0.3	0.4	0.4	0.3
Zacapa	0.4	0.6	0.7	0.7
North (Norte)	0.7	1.0	1.0	1.0
Alta Verapaz	0.5	0.7	0.7	0.7
Baja Verapaz	0.2	0.4	0.3	0.3
Peten	0.1	0.3	0.4	0.4
Total	24.9	33.4	37.8	41.4
Highlands (Altiplano) ***	30.7	26.3	24.9	23.6
Chimaltenango	2.9	2.4	2.2	2.0
Guatemala	4.3	4.1	4.0	3.9
Huehuetenango	6.7	5.7	5.7	5.7
Quetzaltenango	5.1	4.1	3.5	3.2
Quiché	5.7	5.1	4.9	4.7
Sacatepequez	0.8	0.5	0.5	0.4
Solola	2.3	1.6	1.4	1.2
Totonicapan	3.0	2.8	2.7	2.4
South (Sur)	24.8	23.5	21.1	19.8
Escuintla	3.5	4.8	4.1	4.0
Jutiapa	4.5	3.7	3.5	3.1
Retalhuleu	1.9	2.1	1.8	1.7
San Marcos	7.8	6.9	6.4	6.0
Santa Rosa	3.5	2.9	2.6	2.4
Suchitepequez	3.7	3.1	2.7	2.5
East (Oriente)	10.5	9.1	9.0	8.6
Chiquimula	3.6	2.8	2.4	2.0
Izabal	1.2	1.9	2.7	3.2
Jalapa	2.2	1.7	1.6	1.4
Progreso	1.4	1.1	1.0	0.9
Zacapa	2.1	1.6	1.4	1.1

North (Norte)	8.5	7.3	6.4	5.6
Alta Verapaz	6.3	5.4	4.7	4.0
Baja Verapaz	2.2	1.9	1.7	1.6
Peten	0.5	0.3	0.8	1.0
Total	75.1	66.6	62.2	58.6

* - urban and rural

** - urban only

*** - rural only

Source: National Economic Planning Council. Cuadros Estadísticos de la Población, January 1978, as cited in World Bank, Guatemala Country Economic Memorandum, 1980.

Principal Towns
(1973 census)

Guatemala City (capital)	700,504	Puerto Barrios	22,598
Quezaltenango	53,021	Retalhuleu	19,060
Escuintla	33,205	Chiquimula	16,126
Mazatenango	23,285		

Source: Europa Year Book, Vol. II, 1980.

5. Health, Nutrition, and Housing

5.1 Health Overview

An estimated 60-70% of the population are without modern medical services. The health care system is implemented primarily by two groups: Ministry of Health (MOH) and Private Voluntary Organizations (PVO'S). PVO'S have emphasized outreach programs in rural areas and primary care in simple facilities or in the home, whereas MOH has operated mainly from sophisticated in-patient facilities in the capital area, has been highly centralized, and has virtually no outreach service. Both work cooperatively at the municipal level (PVO'S referring more serious cases to MOH facilities), but there has been little coordination at the departmental level and essentially none at the national level. However, PVO services are concentrated in a few rural areas.

Approximately 500,000 full and part-time workers and their 1,500,000 dependents either have no ready access to medical care or are not covered by medical plans; 80% work in the South Coast Area. Highest rates of malnutrition as well as intestinal and respiratory infections are among finca population. Most migrate from Western Highlands, work 90 days and then return. (See National Population.)

Mortality rates:

Rates for 1974: 9 per 1,000 in Capital Metro Area
21.5 per 1,000 in El Peten
19 per 1,000 in Totonicapan
16 per 1,000 in El Quiche, Solola, Alta Verapaz

There has been some progress in recent years in the health sector, with growing government acceptance of a health delivery mechanism stressing preventive medicine. Nearly all of the 636 health posts and health centers now in existence have been built since 1970.

5.2 Summary of Diseases

The primary health problem is high mortality rates for respiratory and gastro-intestinal diseases, especially for children 1-5 years old; main reasons for seeking medical attention for children under 5 were diarrhea and enteric diseases. Substantial malnutrition in rural areas results in higher disease incidence/mortality rates in rural than in urban areas. The 5 leading causes of morbidity in 1974 were enteritis and other diarrheal diseases, acute respiratory infections, avitaminoses and other

nutritional deficiencies, skin infections, and anemia. In addition, the general population suffers from high rates of parasitic infections, primarily from intestinal helminths (*Ascaris*, hookworm and *Trichocephalus*), malaria, and onchocerciasis. In the first half of 1977, 6,000 cases of malaria were reported in the Department of Esquintla: heavy use of pesticides on cotton and corn has increased not only anopheles immunity but toxic poisoning of population.

Major Causes of Death: *

(Rate per 10,000 Population and Percentage Distribution)

<u>Causative Diseases</u>		<u>Per 10,000 Inhabitants</u>	<u>%</u>
1. Acute respiratory diseases	14,593	25.37	20.83
2. Diarrheas	13,063	22.71	18.65
3. Nutritional deficiencies	4,783	8.31	6.83
4. Perinatal mortality	4,228	7.35	6.04
5. Intestinal parasites	2,306	4.01	3.29
6. Respiratory conditions	2,210	3.84	3.16
7. Cancer	1,594	2.77	2.28
8. Cardiovascular diseases	1,558	2.70	2.22
9. Other causes	25,710	44.86	36.70

* As of 1973

Source: Secretaria General Consejo Nacional de Planificacion Economica, Plan Nacional de Salud, 1974, Volume 1, p 12.

5.3 Vital Statistics

1/ Crude birth rate (1976)	41/1,000 population
1/ Crude death rate (1976)	12/1,000 population
1/ Infant mortality (1976)	77/1,000 live births*
2/ Life expectancy	Ladino 60 years; Indians 49 years

1/ World Bank, Guatemala Country Economic Memorandum, 1980.
2/ AID. Guatemala Country Development Strategy Statement FY 82, January 1980.

* Actual infant mortality may be as high as 100/1,000 live births, according to the Central American Institute for Nutrition, since deaths, especially those of infants, often go unregistered. Child

mortality rate for Indians is about 1.7 times greater than the rate for non-Indians. (AID, Guatemala Country Development Strategy Statement FY 82, January 1980.)

5.4 Health Facilities

Poor maintenance and underuse of equipment is a chronic problem that in recent years has increased because most MOH allocations go to building new facilities rather than repairing old ones. MOH financing heavily favors Guatemala City over rural areas, creating a serious imbalance not only for health facilities but for personnel, medicines, and infrastructure in general; 51% of MOH budget goes to Department of Guatemala. (See Health Personnel and Health Sector Overview.)

131 hospitals in 1977; 37 hospitals run by MOH with a total of 9,407 beds (1.6 beds per 1,000), 60% of which are located in capital department. Guatemalan Institute of Social Security (IGSS) runs 35 hospitals with 1,767 beds, as well as 20 ambulatory care units; again, half of IGSS beds are in Guatemala City. There are also 59 private hospitals with 1,200 beds, two-thirds of which are located in the capital. (See also Host Resources.)

Other Health Facilities:

Military: Well developed health care program: 500 beds in Guatemala City and 48 clinics throughout the country, all staffed/operated by military personnel.

National Police: National hospital in Guatemala City and small clinic in Quezaltenango

Aprofam: Guatemalan affiliate of International Planned Parenthood operates 5 clinics in Guatemala City.

Centers and Clinics:

MOH operates 470 health posts and 159 health centers located in towns of 200-2,000 people; staffed mainly by auxiliary nurses.

Projects:

During the next 5 years in and around Guatemala City: 500-bed addition at Military Hospital, and two 400-bed units to replace hospitals of San Juan de Dios and Antigua damaged by the 1976 quake.

5.5 Health Personnel

Training and distribution of MD's is concentrated in capital. In 1977 there were 928 MOH physicians, 410 in Guatemala City, which has 15% of the total population but 40% of the MD's, 43% of the dentists, and 45% of the nurses and lab technicians. There are approximately 2,000 active physicians in Guatemala but estimates vary widely. MOH physicians are required to work 4 hours a day for ministry but few keep regular hours, and most supplement incomes with private practice.

Despite vociferous protest from medical organizations, the GOG is increasing the number and training of rural health technicians (TSR'S) who act as mid-level health workers and community organizers, and serve in predominantly Indian areas; 30% speak Indian languages, all speak Spanish. TSR'S were instrumental in assisting devastated communities during the 1976 quake: they identified community leaders, gave first aid, and organized committees.

Healers (curanderos) and midwives (comadronas) are still ubiquitous providers of health care, especially in rural areas. There were approximately 9,000 healers and 16,000 midwives in 1975.

Location of TSR Graduates By Department

<u>Departments</u>	<u>TSR Graduates</u>	<u>Department</u>	<u>TSR Graduates</u>
Totonicapan	8	Sacatepequez	10
El Quiche	21	Solola	8
El Peten	3	Jutiapa	7
El Progreso	13	Suchitepequez	4
Zacpa	15	Jalapa	4
Alta Verapaz	16	Izabal	4
Baja Verapaz	13	Guatemala	1
San Marcos	13	Indaps, Quirigua	5
Chiquimula	11	Academy of Medical, Physical	
Huehuetenango	8	Natural Sciences	3
Quezaltenango	24	Division of Human Resources,	
Chimaltenango	17	MOH	1

	Dept. of Guatemala Number of <u>Personnel</u>	Rest of the Country Number of <u>Personnel</u>
Doctors	410	518
Professional nurses	312	241
Auxiliary nurses	1,163	1,502
Sanitary inspectors	63	127
Rural health technicians	--	102
Supervisors	46	6
Laboratory technicians	254	96
Dentists	44	49
Total	2,292	2,641

Source: Health Unit of the Planning Council

5.6 Nutrition

Nutritional deficiencies are a major problem: caloric deficit of poorest half of the population is 40% of MDR. During the last 7 years real consumption of corn declined from 555 gm. per day in 1968 to 278 gm. per day in 1976. Bean consumption (main source of protein) remained steady for last 8 years at 28 gm. per day. Despite price subsidies, Incaparina* had limited nutritional impact; prices still high relative to low purchasing power. Other MOH programs: fortification of sugar with vitamin A and iodization of salt.

Using the Gomez classification of malnutrition, studies have found some 81% of children under the age of 5 to be malnourished, 30% severely.

* Fortified corn product

5.7 Diet Summary

Corn (as tortillas) is the dietary staple of much of the population. Wheat (as bread) is mainly used in urban areas. Black beans and broad beans are also eaten daily. Tomatoes are widely consumed; fruits only in small amounts. Meat is used in soups or served with staple foods. Generally, consumption of milk and eggs is low.

Potatoes are basic in the diet of some Indians living at high altitudes. Wheat, plantain, cassava (as tortillas), and rice constitute the main elements in the diet of Black Caribs; fish and pork complement staples.

Emergency Foods:

Alternative staples: rice, wheat-flour, oats
Alternative accompaniments: pulses, milk-powder

Meals:

Breakfast - beans, tortillas or bread, coffee, cheese, if available.
Milk, eggs, and cream are luxuries.

Lunch - Caldo (soup) containing meat leftovers, vegetables, rice, and tortillas. Coffee

Dinner - Leftovers from lunch, beans, tortillas, possibly fried plantains. Coffee

5.8 Staple Foods

Flour - Corn, wheat. Latter used in French-type bread or buns; cassava (Black Caribs).

Fats - Animal and vegetable (especially cottonseed oil); lard used in rural areas because butter, margarine, and oil are more expensive

Vegetables and Fruits - Vegetables grown in highlands - cabbage; potatoes, tomatoes, peas, beans, carrots, radishes, beets; consumed fresh because there are no storage facilities; seasonal fruits eaten fresh: banana, papaya, oranges, pineapples.

Milk - Too expensive for most families. Milk is drunk when available (may be goat's). Cream is sometimes used with mashed black beans. Cheese is liked.

Meat - Consumed fresh. Mostly beef but also pork, mutton, goat. Chicken is the only commonly used fowl.

Fish - Little used. Both fresh and salt water fish available.
Dried fish used in sauces; otherwise it is served fresh.

Beverages - Coffee is the most common drink. If available and affordable, colas, refrescos (fruit drinks) are consumed.

Children's Diet - Infants breastfed until 2 years old; supplementary foods include bananas, weak coffee from bottles; children's diet is like parents', but meat usually is reserved for adults.

5.9 Cooking/Utensils

Urban households cook inside, using kerosene stoves or burners. In rural homes, open adobe ovens that are fueled by wood or charcoal are used.

Cooking pots are frequently made of clay, less often of metal. For serving, utensils may be of metal, china, glass, or wood; gourds cut in half are used by the very poor. Cutlery is of cheap light metal. Plastic and clay jugs are used for carrying water.

5.10 Housing Overview

Because the country's surplus rural population is forced to migrate to urban centers to secure jobs, Guatemala City and other cities are growing faster than the nation as a whole. Urban population has grown from 25% of the total population in 1950 to about 40% in 1980.

The production of minimum standard shelters has lagged far behind this rapid urban population growth. Despite large national and internationally assisted efforts to build housing for victims of the 1976 earthquake, current production reaches 1/4 of the housing goal set forth in the current National Development Plan so, as a result of this gap, the population has resorted to informal solutions, with an average housing production of over 18,000 units a year. Geography of Guatemala City, public policy and the skyrocketing cost of land around Guatemala City have severely constrained even the informal housing solution possibilities.

5.11 Housing Policy and Institutions

In November 1975, a document, "Development Policy of the Housing Sector" was prepared as part of the National Plan for 1975-79. The document proposed a national savings and loan system backed by BANVI (Banco Nacional de la Vivienda), an existing institution which engages in operations similar to those of commercial banks. BANVI would serve as the central institution and would create a National Housing and Urban Development Committee, which in turn would produce a National Housing Plan and a National Social Housing Plan.

At present the GOG has two major housing or housing-related agencies: the FHA (Instituto de Fomento de Hipotecas Aseguradas-Institute of Insured Mortgages) and BANVI (Banco Nacional de la Vivienda-National Housing Bank). The FHA, created in 1962, issues insured home mortgages representing up to 95% of the value of the house, and attempts to attract private capital to the housing market. BANVI was founded in 1973 and, as a federally owned development and finance institution, is responsible for formulating national housing policy.

The attention of these two agencies is focused primarily upon housing need in urban areas, especially Guatemala City. Although other institutions indirectly affect rural housing, no agency has been specifically designated to respond to rural housing needs.

Private commercial banks are the primary source of credit for housing in Guatemala, along with private insurance and finance companies. When these institutions are associated with FHA, risk free investment with high rates of return is guaranteed. However, there is a strong indication of a significant informal financing system operating outside the formal housing finance system. Short-term expensive credit serves middle and lower income groups and small entrepreneurs.

BANDESA, the National Agricultural Development Bank, is mandated to provide assistance for agricultural activities and rural housing. 34 agencies which authorize and administer loans, located throughout 7 regions, operate as field offices for BANDESA.

The cooperative movement also contributes to filling the housing need in rural Guatemala. The federations of cooperatives that represent credit unions and agricultural cooperatives, the National Federation of Credit Unions (FENACOAC) and the Federation of Regional Agricultural Cooperatives (FECOAR) constitute 85% of all legalized cooperatives.

FENACOAC, with regional offices and storage facilities in three urban centers outside Guatemala City, provides its members with credit, savings, insurance, administrative and accounting assistance, education, fertilizer

supply and marketing services. In contrast, very few of the loans made by FECOAR cooperatives are for shelter needs. However, two FECOAR cooperatives have undertaken housing programs financed by BANDESA with Inter-American Development Bank funds.

There are about 90 construction firms registered with the Guatemalan Chamber of Commerce, the majority of which have the capability to work in housing construction. The firms are concentrated in the Guatemala City metropolitan area but only about 10 of them have experience with large scale housing projects. (The Guatemalan Chamber of Commerce should be contacted for current information on construction firms. See also Disaster Resources.)

Engineering analysis indicates a dangerous lack of construction industry standards, especially building codes and specifications. Among them: widespread failure to use non-structural masonry walls in reinforced-concrete framed structures (vulnerable to lateral loads and displacement); lack of reinforced-concrete columns (framing masonry vulnerable to collapse); preference for buildings with heavy parapets (extremely dangerous to people at street level). The recommendation from the US Geological Survey on 2/76 quake is adamant: adopt and enforce minimum standards for structural reinforcement, regardless of the material used.

Note: In rural highland areas, most families traditionally constructed homes of materials produced (adobe) or gathered (wood) by family members. Only roofing was likely to be purchased.

5.12 Disaster/Low Cost Housing

Most damage from the 1976 earthquake and previous earthquakes was due to the collapse of massive adobe brick walls and heavy tile roofs. Also, deaths resulted when squatter homes, built on ravine slopes, slid down following earthquake-induced landslides. The earthquake was characterized as "class conscious" in two respects:

- the poor lived in the most vulnerable areas, and therefore were most adversely affected;
- low-income individuals were the least able to afford the quality of construction which would ensure survival of their dwellings.

As a result of the earthquake, of February 4, 1976, 258,000 housing units were damaged seriously or destroyed, 58,000 in Guatemala City alone,

of which 80%, about 46,000, are estimated to have belonged to the urban poor. Many of these units were already included in the housing deficit, but it is clear that the housing problem has been seriously aggravated by the earthquake. Since the earthquake, several large housing reconstruction loans have been made to Guatemala as shown below.

<u>Institution</u>	<u>No. of Units</u>	<u>House Sales Price \$</u>	<u>Time Frame</u>
*1. BANVI-WORLD BANK Sites-Services	10,000	1,400 to 3,600	77-79
*2. BANVI-International Agencies, e.g.: Church World Services	3,700	2,500	76-78
*3. BANVI-GOG Self-Help	555	1,000	76-78
*4. BANVI-GOG	5,000	1,800	76-78
*5. BANVI-GOG	1,100	1,600 to 3,000	76-78
*6. BANVI-CABEI	2,000	3,000	76-78
7. BANVI - Justo Rufino Barrios	200	5,500	77-78
*8. BANVI Bello Horizonte	880	6,500	77-78
9. BANVI El Tesoro	220	9,500	77-78
10. BANVI Individual Credits	800	2,000-6,000	76-78
11. Banco Granai & Townson			
Project 1)	355	16,000 to 32,000	
Project 2)	60	28,000 to 59,000	77-78
Project 3)	280	29,000 to 59,000	77-79

12. Banco Inmobiliario

Project 1)	2,000	13,000 to 40,000	76-78
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13. Banco Internacional

Project 1)	216	19,500	77-78
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Project 2)	60	60,000	77-78
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Project 3)	800	42,000	78-80
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Project 4)	400	40,000	78-79
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Project 5)	120	65,000	78-80
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* Reconstruction Loans

Source: USAID, Office of Housing. Project Paper ROCAP - Urban Shelter Improvement 1978

For the reconstruction effort, the GOG decided to use the institutional framework already in place. BANVI and BANDESA took primary responsibility for the execution of the reconstruction program in housing. A substantial role was also planned for FHA and private banks. FENACOAC requested assistance from BANVI and BANDESA and purchased construction materials (roofing, concrete blocks and lumber). FECOAR purchased sheets of roofing for its members. The World Bank Inter-American Bank channelled their loans through BANVI and BANDESA. In addition, the Penny Foundation (Fundacion del Centavo), a non-profit foundation whose objective is to assist in rural and urban development in Guatemala, sought donations for a home improvement program in rural areas.

The GOG adopted the following policy with regard to shelter reconstruction:

- . The effort should be labor intensive and directed toward the re-establishment of small dwellings or enterprises destroyed or made unoperational by the earthquake
- . Provision of potable water, health services, electric power (especially for small establishments and domestic lighting), communication, and public transportation in low-income settlements should take priority
- . Low cost shelter should be within the financial reach of the poor.

Problems encountered in the shelter reconstruction effort were as follows:

- . the earthquake occurred in the middle of the harvest season. As a result, many farmers were more concerned with gathering and marketing crops than with rebuilding or repairing their houses;
- . campsites did not permit people to be near their houses and livestock and many individuals did not want to leave what remained of their property unprotected. Therefore, many camps were not occupied;
- . there was a failure to match casualty and damage statistics with relief supplies;
- . timber and adobe dust swept aside as rubbish should have been used as rebuilding materials, especially in lower income areas;
- . land tenure patterns and general settlement patterns were not observed in reconstruction projects.

However, several positive aspects emerged to balance the problems. Co-ops were utilized successfully to distribute relief supplies, especially to lower income individuals and families. The self help approach and sale of materials at subsidized prices (to prevent "handout" dependency) encouraged full participation of the population in the reconstruction effort.

In addition to the reconstruction projects mentioned, a \$40 million urban reconstruction project was considered, utilizing a \$2 million contribution from each other Central American country, \$3 million from CABEL's resources, \$10 million from the IDB Social Progress Trust Fund and a \$19 million HG loan from AID. After prolonged negotiation, it was determined that the IDB funds were not available.

However, a housing guaranty loan to the Central American Bank for Economic Integration (CABEL), augmented by funds from other Central American countries, was utilized by BANVI (National Housing Bank of Guatemala) for construction of apartment units in Guatemala City; cooperative projects in the capital and secondary cities; and individual units on property already individually owned by families in the capital and secondary cities.

The basic concrete frame design of these units incorporated seismic resistant features and the project was not located over any known faults. All proposed designs were evaluated for their seismic resistant features.

5.13 Housing Types, Materials, Construction and Services

In rural areas, housing typically consists of one room, covered by thatching. The floors are generally earthen, and the walls are built of cane and mud plaster or adobe. Services are lacking, with only 9% of rural housing having access to piped water, 40% to electricity, 10% to latrines.

Urban housing is characterized by concrete slab or corrugated asbestos cement-sheet roofing (although the second material is not accepted by the FHA). Walls are fabricated of clay blocks with "mochetas" or light columns of steel rods and concrete filling the clay block cavities. The wall is capped by a reinforced concrete tie beam. Floors are concrete slabs covered with cement floor tiles in the living areas and with ceramic tile in the bathrooms. Concrete is utilized for footings, while typical windows are iron framed glass; doors and door frames are wood. Squatter settlements and lower income housing are constructed typically of adobe, which is especially vulnerable to earthquake damage.

TYPICAL MATERIALS FOR RURAL AND URBAN HOUSING COMPONENTS

	<u>Rural</u>	<u>Urban</u>
Roof	<ul style="list-style-type: none"> - thatched with paja (straw) in highlands or palma (palm leaves) in eastern region; used by minority of population - tile (1000-3000 tiles at a cost of Q20 - Q30 per 1000 tiles) - lamina - corrugated steel sheeting galvanized with zinc 	<ul style="list-style-type: none"> - concrete slabs - duralite (corrugated asbestos-cement panels); not accepted by FHA - tile; cardboard or lamina for squatter settlements
Walls	<ul style="list-style-type: none"> - adobe bricks (mud, straw, pine needles) - cane; walls made of cornstalks, lined up and bound together (considered low prestige and used only by people who could not afford more expensive material) - bajareque; walls made with rows of cane or wood filled with mud 	<ul style="list-style-type: none"> - clay blocks with "mochetas" (light columns of steel) - unreinforced adobe for squatter settlements; Also, cardboard and wood

- cement block (high prestige: very few houses)
 - no corner posts with exception of cement
- Floor - earthen
- concrete slabs covered with cement floor tiles in living areas and with ceramic tile in the bathroom
 - earthen for squatter settlements.
- Window - open air, may be barred or shuttered; highland Indian houses often windowless
- iron framed glass
 - open air for squatter settlements.

In 1976, the overall material supply was about equal to the total construction demand. Total installed cement production capacity was more than adequate; however, sand and stone production were pressed. Precast concrete supply was less than the demand, and lumber has been scarce.

INSTALLED CAPACITY AND INDUSTRIAL PRODUCTION
OF THE PRINCIPAL CONSTRUCTION MATERIALS
1974

<u>Materials</u>	<u>Production</u>		<u>Installed Capacity</u>	<u>Use of Capacity (%)</u>
	<u>Volume</u>	<u>Value</u>		
Dimensional lumber	85,648 B ₂ F.	11,309	100,000	85.6
Plywood	550,500 m ²	900	847,000	65.0
Boards of various widths	230,800 m ²	532	355,000	65.0
Cement	319,879 tons	10,914	460,000	69.5
Lime	36,480 tons	1,322	40,000	91.2
Aggregate	596,000 m ³	1,814	800,000	74.5
Common brick	6,669,000 units	121	8,500	78.5
Hollow bricks or clay tile	22,264,000 units	976	32,000	69.6
Clay tile	932,000 units	14	1,200	77.7
Cement flooring	421,000 m ²	755	525,000	80.2
Ceramic tile for walls and floors	282,500 m ²	765	480,000	58.9
Concrete blocks	7,534,000 units	965	11,000	68.5

Asbestos cement sheet	1,590,800 m ²	1,973	2,200,000	72.3
Asbestos cement pipe	277,300 m	614	465,000	59.6
Cement pipes	365,700 units	527	450,000	81.3
Cement laundry trays	3,342 units	26	4,600	72.7
Reinforcing rods	17,149 MT	7,030	35,000	49.0
Galvanized sheets for roofing	20,500 MT	6,455	28,000	73.2
Iron or steel pipes	8,400 "	5,149	11,800	71.2
Steel joists and trusses	7,500 "	5,600	12,000	62.5
Iron frames for doors and windows	675 "	565	1,050	64.3
Aluminum frames for doors and windows	1,600 "	1,680	2,200	72.7
PVC piping	1,080 "	1,210	1,600	67.5
Paint	4,400,000 liter	5,058	7,000,000	64.0

Source: AID, Office of Housing, Shelter and Related Development in Guatemala: Analysis and Recommendation for AID Support, May 1976.

Only about 40% of the national population have access to piped water or another safe supply; the percentage is much lower in rural areas. A high leakage rate in the water distribution system in Guatemala City limits functioning of treatment plants to about 12 hours per day, affecting water quality. Water systems in 75 urban and 240 rural localities were partially or totally destroyed in the 1976 earthquake with that of the capital city extensively damaged. The danger of contamination was especially great in urban areas where cross connection between water and sewerage lines was a possibility. As of January 1977, much of the damage still had not been repaired.

Sewerage systems served only about 11-14% of the population in the 1970's. Wastewater treatment is non-existent.

6. Economy

6.1 Overview of Economy

The economy is based on agriculture (principal exports: coffee, cotton, sugar, beef), manufacturing, and tourism; mining and petroleum production are potentially important. Resources include large areas of high-quality farmland on the Pacific Coastal Plain and in the Peten, commercially exploitable oil, nickel, copper, and other minerals, pine and hardwood forests, fish and shellfish, and exceptional location and sites for tourism.

Manufacturing concentrates on production of consumed goods (75% of output and value-added). Food processing, beverages, clothing and footwear, and metal products are important industries. There is a chronic shortage of skilled and semi-skilled workers. One fourth of production is exported, half of this is to Central American Common Market countries.

Infrastructure connects major production and consumption centers and principal ports, but does not serve Atlantic departments or Peten adequately; a serious shortage of rural all-weather farm-to-market roads exists.

In the last two decades the economy was characterized by steady and substantial economic growth, averaging 5.7% per year. Government deficits were small in comparison to GDP; Central Bank Financing was minimal. In combination with a relatively liberal trade policy, the above factors kept inflation very low until the 1973 oil crisis. External borrowing was minimal due to a low current accounts deficit. Major economic fluctuations were avoided; the Quetzal was recently chosen as a world reserve currency by IMF.

The limited role of the public sector in development continues to reinforce isolation of rural indigenous population (over 40% of nation) outside the monetized economy. Gap between Ladino and Indian in health, education, and income has changed little since the 1950's. Low productivity in traditional agriculture and weak domestic demand for traditional consumer products are significant constraints on growth and necessitate expansion of economic and social services.

The economically active population is only 29.9% of the total population, one of the lowest rates in Latin America. There is 13% open unemployment; actually unemployment and underemployment are probably substantially higher, as much as 12% in urban areas and 42% in the countryside. Growth rates for employment are low, especially in agriculture, in

comparison with other economic growth rates; the reverse of this situation is true in most Latin American countries. Income distribution is heavily concentrated at the upper end of the scale, with relative equality in the lower 3 quarters. Productivity and income disparity between rural and urban economic activities, and great differences within urban areas, are probable causes.

6.2 Recent Trends and Future Prospects

Despite the loss of some \$750 million in assets during the 1976 earthquake, the country's economy expanded during 1976-77, the rate of increase exceeding 8% the latter year. Primary factors were the extensive reconstruction activity and higher export earnings, especially from coffee, reinforced by large inflows of foreign aid, expansionary credit policy, and increased Central American trade. The growth rate fell to 5.2% in 1978 with the passing of the reconstruction boom and falling coffee prices, dropping even further to an estimated 4.5% in 1979.

The construction and manufacturing sectors were the main beneficiaries of reconstruction activity, the former growing by an average 25% annually during 1976-78. A decline in real value added is anticipated in both sectors with the general economic slowdown. Serious shortages in cement were encountered during the period as the capacity of the only plant went about 25% below demand levels. The Exmibal nickel plant began producing 75% nickel sulfide matte in 1978 at levels well below capacity of 28 million pounds per year. Oil self-sufficiency is not expected in the near future, despite continuing exploration and estimated reserves of 18,000-20,000 bpd. The tourist industry, second to coffee in foreign exchange earnings in 1975, was hurt by the earthquake and the country's political unrest.

With economic activity traditionally reflecting export earnings, lower GDP growth rates are projected for the next few years (3-4% for 1979-80, 4.5% by 1984-85 by World Bank estimates); public investment is expected to decline as well (from 20% of GDP to 15% by mid-1980's). The emphasis of the 1979-82 Development Plan on opening new agricultural areas and decentralizing industry shows a growing GOG willingness to address social and economic inequalities. Given the serious social tensions within the country, major investment in social development programs is also needed, necessitating better use of the redistributive potential in a sound fiscal policy.

6.3 GNP/GDP

Gross Domestic Product by Sector (1958 Market Prices)
(millions of Quetzales)

<u>Sector</u>	<u>1970</u>	<u>1975</u>	<u>1978</u>
Primary Production	491.4	662.0	751.5
Agriculture	489.7	659.9	745.9
Mining	1.7	2.1	5.6
Secondary Production	332.9	433.0	599.5
Manufacturing	283.0	356.3	467.0
Construction	28.4	43.9	88.1
Public utilities	21.5	32.8	44.4
Service	968.5	1,257.7	1,527.8
Transport & Storage	98.2	150.8	195.9
Commerce	517.9	648.7	798.6
Banking, Insurance & Fin.	42.3	61.3	91.1
Housing	124.8	138.7	128.5
Public Admin. & Defense	86.3	118.2	141.5
Personal Services	98.3	140.0	172.2
Gross Domestic Product	1,792.7	2,352.7	2,878.8

Source: Bank of Guatemala as cited in World Bank, Guatemala Country Economic Memorandum, 1980.

6.4 Balance of Payments

The balance of payments prospects appear favorable for the near future. Despite the drop in coffee prices from their peak in 1977, the level of earnings from coffee should be higher than before 1977. Other major exports also have reasonably good prospects. Reducing imports relative to GDP so that they are more consistent with export earning capabilities, while not adversely affecting growth, is a present challenge. The World Bank expects a more or less spontaneous adjustment as economic growth slows. Chances for limiting import growth are enhanced, for example, by the expected slower growth of capital goods imports as several infrastructure projects are completed, as well as by the discovery of oil in the Peten and the GOG's emphasis on replacing oil-fired thermal power plants with hydropower facilities.

The 1979 trade deficit of about \$250 million was largely covered by capital inflows; reserves remained high at about \$700 million. The public debt service ratio was a low 2.1% of exports in 1978.

Balance of Payments, 1974-78
(millions of dollars)

<u>Item</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Exports GNFS	846.8	976.1	1,343.9	1,348.7
Imports GNFS	912.8	1,189.2	1,381.9	1,637.3
Resource Balance	-66.0	-213.1	-38.1	-288.6
Net Factor Income	-69.0	-56.1	-44.7	-29.1
Net Current Transfers	72.6	198.9	94.8	114.5
Current Account Balance	-62.4	-70.3	12.1	-203.2
Private Capital	117.4	240.8	109.9	175.0
Official Capital	63.3	38.8	36.3	98.9
Change in Reserves (- = gain)	-118.3	-209.3	-158.3	-70.7
Memo Items				
Net International Reserves	294.8	504.1	662.4	733.1
Months of Reserves	3.7	5.1	5.8	5.4
Debt Service Ratio	1.6	1.5	1.3	2.3

Source: World Bank, Guatemala Country Economic Memorandum, 1980.

6.5 Imports

Imports have grown rapidly in recent years with the largest increases in capital goods for industry (especially for Exmibal and oil exploration). With the completion of major projects in mining, hotels, and hydro-power, World Bank expects slower growth in that category. Intermediate imports should also grow more slowly due to inventory build up in 1978. The structure of imports has remained relatively constant with similar increases in value in most categories. Higher prices, especially for petroleum, raised the value of imports 17% in 1979 to \$1.45 billion, which was forecast to reach \$1.6 billion in 1980.

Major trade partners (1978): US, Federal Republic of Germany, El Salvador, Japan, Venezuela.

Merchandise Imports by End Use (CIF)
(millions of dollars)

	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Consumer Goods	164.9	223.6	274.8	312.2
Non-Durables	111.1	143.8	169.8	189.3
(Food)	62.3	40.1	55.4	50.0
Durables	53.8	79.8	105.0	122.9
Intermediate Goods	398.7	556.2	619.0	712.8
General Materials	253.4	291.1	379.0	453.1
Metal	22.5	30.5	39.0	48.3
Non-Metal	230.9	260.6	340.0	404.8
Construction Materials	37.5	73.1	76.0	91.2
Petroleum & Lubricants	103.3	109.5	144.0	147.8
(Crude Oil)	93.0	99.0	79.0	110.0
Capital Goods	171.7	262.2	284.0	356.4
Agriculture	19.4	24.1	32.0	38.7
Industry & Mining	99.8	172.2	167.0	215.5
Transport Equipment	52.5	65.9	85.0	102.2
Total	735.3	1,042.0	1,177.8	1,381.4

Source: Bank of Guatemala, Estudio Económico y Memoria de Labores as cited in World Bank, Guatemala Country Economic Memorandum, 1980.

6.6 Exports

Economic performance has traditionally been closely tied to export activity. Lower world prices, since mid-1977, for coffee (the major export) have contributed to the country's economic slowdown. Diversification and expansion of exports have again become an issue. Most manufactured exports go to other Central American countries, but prospects for increased trade in that market are dimmed by market saturation, fragmentation, and political violence in the region.

The value of 1979 exports remained at about the level of 1978: \$1.1 to \$1.2 billion. It was expected to reach about \$1.4 billion in 1980.

Major trade partners (1978): U.S. Federal Republic of Germany, El Salvador, Japan, Costa Rica.

Exports of Major Products
(Values, Volumes and Prices as Indicated)

<u>Product</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Agricultural Products -			
Value	555.2	903.7	802.6
Bananas			
Value - mls dls	45.7	45.6	49.9
Volume - ths mt	302.8	286.1	287.8
- mls boxes	16.6	15.7	15.8
Beef			
Value - mls dls	14.5	27.9	27.5
Volume - ths mt	9.7	18.9	14.3
- ths qq	214.3	416.7	314.6
Coffee			
Value - mls dls	243.0	526.5	455.0
Volume - ths mt	119.1	132.8	124.7
- ths qq	2,619.8	2,921.2	2,743.4
- ths bags (60 kg)	1,984.7	2,213.0	2,078.3
Cotton			
Value - mls dls	87.8	152.1	161.6
Volume - ths mt	117.8	123.3	131.5
- ths bales (500 lb)	518.4	542.6	578.6
Sugar (centrifugal)			
Value - mls dls	106.7	81.8	28.6
Volume - ths mt	314.2	292.2	163.3
- ths qq	1,911.3	6,427.5	3,592.6
Other Agricultural Products			
Value - mls dls	57.6	69.9	80.0
Mineral Products			
Value - mls dls	7.5	7.3	16.3
Volume - ths Mt	20.9	20.0	22.4
- ths qq	458.9	440.7	492.8
Nickel			
Value - mls dls	-	-	6.6
Volume - ths mt	-	-	1.4
- ths lbs	-	-	3,080.0
Other			
Value - mls dls	7.5	7.3	9.7
Volume	20.9	20.0	21.0

<u>Product</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Manufactured Products Value - mils dirrs	221.7	267.8	341.5
Total Value	784.4	1,178.8	1,160.4

Source: Bank of Guatemala, Boletín Estadístico as cited in World Bank, Guatemala Country Economic Memorandum, 1980.

7. Agriculture

7.1 Overview of Agriculture

The sector contributes over 25% of GDP, three fifths of total employment, and two thirds of export value. Export agriculture has contributed a substantial share of investment resources; agricultural raw materials (sugar cane, cattle) serve as a base for industrial expansion. Nevertheless, limited public and private investment in agriculture, especially in traditional crops (coffee and basic grains) is a major cause of lagging productivity and stagnating incomes for grain producers.

Land tenure, land use, and the government's role in agriculture were dominant themes of 1970's. Land distribution is highly skewed: 60% of the population is on 26% of the land area in the Western Highlands. The average family does not have enough land to provide for basic needs. Erosion and reduced productivity are the consequences of overuse of mountain terrain. In contrast, coastal and Peten lands, more suited to farming, are under-used, especially those held by National Agrarian Transformation Institute. Recent high prices for exported crops, combined with GOG marketing policy of providing imported grain below cost in urban areas, resulted in shift from grains and beans to sugar and cotton by Pacific Coast growers. In 1974, revised government policy 1) demanded that large farms have at least 10% of land under basic grains; 2) made available improved credit for grain production; 3) prohibited grain exports; 4) raised guaranteed price of basic grains as much as 100%. By 1976, IBRD reported substantially increased production. As of 1977, GOG had also increased appropriation of funds for agriculture and provided larger grain storage capacity. The government controls prices for many raw and processed food commodities (meat, grains, and cereals, vegetable oils, sugar, milk), import and export licensing, and quotas.

Crops planted and production techniques used vary with the region, the ethnic affiliation, and the socioeconomic status of the producers. Most basic grains are grown by traditional subsistence methods (slash and burn agriculture, intensive cultivation, hand labor on small family plots) in Western Highlands. In drier Eastern Altiplano, tropical fruits and livestock are primary products, since grains and tobacco require irrigation there. Pacific Coastal Plain produces coffee on mountain slopes, sugar cane, cotton and livestock in Transition Zone, and cotton, rubber, bananas, sugar cane, tropical fruits and cattle on large farms of the Coastal Plain. The Peten and Northern Slopes (over 40% of national territory) have good agricultural potential but are little developed at present, due to lack of infrastructure.

Guatemala.

7. Agriculture

Cultivated Area, Production and Yield of Principal Crops
(ths. of hectares; ths. of metric tons; kg/ha)

<u>Product</u>	<u>1970</u>	<u>1975</u>	<u>1978</u>
Basic Grains			
Corn			
Cultivated Area	693.4	561.7	498.9
Production	718.8	659.5	572.5
Yield	1,036.6	1,174.1	1,147.5
Beans			
Cultivated Area	185.0	84.9	134.2
Production	62.5	58.5	35.1
Yield	337.8	689.0	261.6
Rice			
Cultivated Area	9.4	12.2	10.7
Production	14.5	19.4	17.3
Yield	1,542.6	1,590.1	1,616.8
Wheat			
Cultivated Area	30.3	43.5	25.4
Production	31.2	50.4	32.9
Yield	1,029.7	1,158.6	1,295.3
Sorghum			
Cultivated Area	51.3	74.0	50.4
Production	45.1	60.8	74.6
Yield	879.1	821.6	1,480.1
Export Products			
Coffee			
Cultivated Area	219.3	247.8	244.5
Production	115.2	140.6	145.2
Yield	525.3	567.4	593.9
Cotton			
Cultivated Area	84.6	111.0	127.2
Production	62.8	105.0	141.2
Yield	742.3	945.9	1,110.1
Sugar Cane			
Cultivated Area	21.5	64.2	97.8
Production	1,688.0	4,170.0	5,135.0
Yield (Mt/Ha)	78.5	65.0	63.0
Bananas			
Cultivated Area	5.0	5.0	5.2
Production	284.5	272.2	246.3
Yield (Mt/Ha)	56.9	54.4	47.3
Rubber			
Cultivated Area	3.5	10.6	10.6

Guatemala

7. Agriculture

<u>Product</u>	<u>1970</u>	<u>1975</u>	<u>1980</u>
Production	2.9	8.5	8.5
Yield	816.0	800.0	802.0
Sugar			
Sugar Cane	1,688.0	4,170.0	5,135.0
Refined Sugar	184.6	384.0	444.5
Yield (Kg/Mt)	109.3	92.0	86.6
Total Area Cultivated	1,303.3	1,214.9	1,205.0
Basic Grains	969.4	776.3	719.6
Export Crops	333.9	438.5	485.4

Source: CNPE Marco Cuantitativo Del Sector Agricola, 1978 as cited in World Bank Guatemala Country Economic Memorandum, 1980

Agricultural Value of Production
 (millions of 1958 Quetzales)

<u>Item</u>	<u>1970</u>	<u>1975</u>	<u>1977</u>
Crops	320.25	452.57	485.52
Export Crops	162.91	234.48	249.23
Coffee	108.50	139.22	127.92
Cotton Fiber	29.57	56.72	76.21
Bananas	16.85	25.99	32.11
Cotton Seed	3.29	6.26	8.46
Cardamom	3.28	5.77	3.12
Other	1.42	0.52	1.41
Crops for Local Cons.	121.24	148.20	144.25
Basic	63.59	77.26	68.63
Corn	36.27	43.84	36.49
Beans	25.84	29.07	26.19
Potatoes	1.48	4.35	5.95
Others	57.65	70.94	75.62
Fruits	21.41	24.94	26.51
Vegetables	19.68	22.93	24.37
Lima Beans	1.17	1.36	1.45
Peanuts	0.13	0.15	0.16
Lentils	0.01	0.01	0.01
Other	15.25	21.55	23.12
Industrial Raw Materials	36.10	69.89	92.04
Sugar Cane (Natural)	13.21	28.69	40.75
Sugar Cane (Pure Syrup)	2.84	6.17	8.80
Sugar Cane (Brown Sugar)	6.59	14.32	20.34

<u>Item</u>	<u>1970</u>	<u>1975</u>	<u>1977</u>
Wheat (Unmilled)	4.07	5.76	6.46
Rice	2.45	4.99	2.69
Tobacco	2.12	3.84	4.31
Rubber	2.32	3.74	3.99
Te de Limon	0.93	0.29	0.25
Kenaf Fiber	0.76	0.70	0.80
Citronela	0.15	0.21	0.21
Sesame Seed	0.42	0.68	2.00
Cocoa	0.22	0.46	1.38
Barley	0.02	0.04	0.06
Livestock Sector	172.60	219.91	242.49
Non-meat Products	92.85	121.28	131.23
Meat Products	62.41	69.66	72.35
Beef	30.71	36.54	43.67
Pork	30.98	32.26	27.84
Sheep	0.61	0.75	0.72
Goats	0.11	0.11	0.12
Fowl	17.34	28.97	38.91
Forestry	41.07	47.81	61.81
Inputs to Agric. Sector	49.61	66.81	73.23
Value Added by Sector	489.68	659.42	722.81
Gross Value of Production	539.29	726.23	796.04

Source: Banco de Guatemala. Estudio Economico y Memoria de Labores (Anual) as cited in World Bank Guatemala Country Economic Memorandum, 1980.

7.2 Pesticide Use

Since 1950, heavy use of insecticides (estimated at 80 kg./ha., among the world's highest) on cotton crop, due to naturally occurring severe insect infestations, has resulted in increasing pest resistance and loss of natural predator/parasite controls. The rise in the number of sprays needed per season, from 8 to 30-40, has been paralleled by a rise in the cost of production; however, yields are falling. Human poisonings, most from parathion, are common among farm workers. There are high residues

of insecticides in beef and milk; beef exports are periodically affected. Development of resistance to insecticides among mosquito vectors of malaria on Coastal Plains (only Landrin may still be effective) increases the cost of mosquito control and threat of resurgence of the disease.

7.3 1980 Status

Agriculture made only modest gains during the recent period of economic expansion: less than 5% average growth in 1976-77 and just over 3% in 1978. Coffee is expected to remain the leading source of foreign exchange earnings though the volume of production has generally stagnated. A record harvest in 1978-79, when domestic food production was also at a peak, yielded about 152,000 tons each year. Prolonged fall rains in 1979 reduced the wheat and sorghum harvests and lowered cotton production from 164,000 tons in 1978 to 14,000 tons in 1979. Production of corn, the staple grain, reached a high of 98,000 tons in 1979, while bananas recovered from 472,000 to 475,000 tons. A 6% rise in sugar output to 398,000 tons was forecast for 1979/80 in response to improved world prices; beef production was expected to exceed 100,000 tons in 1980. Domestic food availability was estimated to have risen significantly in 1979 from 1975-77 average of 2,166 calories/day estimated by FAO.

Because of the country's heavy economic dependence on agriculture and the opportunity afforded by land redistribution to attack the problems of rural poverty, the GOG has been giving priority to agricultural and rural development programs. One such major project, now in the very early stages of development, is the opening of the Franja Transversal Norte, a 40 km. wide strip extending from the Caribbean coast to the Rio Ixcam in Huehuetenango.

7.4 Planting/Harvesting Season

<u>Commodity</u>	<u>Planting Season</u>	<u>Harvest Season</u>
Beverages:		
Cacao:		
First Crop	---	August - March
Second Crop	---	February - April
Coffee (Field Plantings of seedlings):		
Lower Elevation	April - May	August - December

<u>Commodity</u>	<u>Planting Season</u>	<u>Harvest Season</u>
Higher Elevation	April - May	October - March
Cereals and Grains:		
Corn:		
First Crop up to 5,500 feet	April - May	August - September
First Crop over 5,500 feet	March - May	October - January
Second Crop up to 4,000 feet	September - November	January - March
Grain Sorghum:		
Main Crop	May - July	September - October
Secondary Crop	November - February	May - June
Rice	April - May	August - December
Wheat:		
Lower Elevation	May - July	October - November
Higher Elevation (Main Crop)	May - July	December - January
Feedstuffs:		
Grain Sorghum	May - July	December - February
Fibers:		
Cotton	May - June	November - February
Abaca	---	Throughout Year
Fruits:		
Bananas:		
Atlantic Coast	---	Throughout Year
Pacific Coast	---	Throughout Year
Oilseeds:		
Peanuts	April - July	November - December
Sesame	May - September	October - January
Sugar Cane (Cuttings)	April - May	December - April
Vegetables:		
Beans	May - June	August - January
Sweet Potatoes (Slips)	March - April	Throughout Year

T-10
1979 UAWA

7.5 Agricultural Imports

Agricultural imports were valued at \$105 million in 1979, about 7% of total imports. Grains, especially wheat, constituted the largest item, valued at \$28 million. Dairy products, cereals, and feedstuffs were others. Wheat imports were expected to increase to 100,000 tons in 1980. Corn imports, reduced somewhat in 1979 because of the good 1978 harvest and extensive drawdowns in stocks, were also expected to increase.

7.6 Agricultural Exports

Agricultural exports, worth \$870 million, made up 72.5% of total exports in 1979. They included coffee (\$485 million), cotton (\$195 million), beef (\$42 million), cardamom (\$43 million), sugar and bananas (\$30 million each). Earnings were expected to be even greater in 1980 due to higher coffee price, and increases from sugar, beef, bananas, and spices. Cotton exports were expected to drop from the 1979 level. Non-traditional products being promoted include rubber, pineapple, sesame, and cardamom, the latter having become a significant export item since 1970.

8. Physical Geography

8.1 Climate

Climate varies with altitude and exposure to coastal air masses. Generally, Pacific and Caribbean coastal lowlands have year-round high temperatures and relative humidity; average annual temperature: 77° F on Pacific Coast, 80° F on Caribbean; relative humidity averages over 80% on both coasts. Like coasts, lowlands of El Peten and the valleys of the Rio Motagua and Rio Dulce-Lake Izabal-Rio Polochic systems are hot and humid. Highland climates fall into the warm-temperate-cool range, cool temperatures occurring above 5,000-6,000 feet, with occasional frost in the November-April dry season. The Oriente Region (east of the capital, from the Motagua River valley south to Sierra Madre and east to highlands of the Honduran frontier) is hot and arid, much like deserts of northern Mexico and southwestern U.S.A. April-October rainy season prevails over most of the country, with highest rainfall month August or September. Rainfall varies from less than 20" annually in Oriente to nearly 200" on western slopes of Sierra Madre and in Rio Dulce Basin. Lower elevations of highland system, shielded from Caribbean and Pacific air masses, receive 20-80" annually.

<u>Location</u> <u>Dept/City</u>	<u>Temp</u> <u>Max/Min</u>	<u>Annual</u> <u>Precip(mm)</u>	<u>Days of</u> <u>Rain</u>
Santa Rosa (La Morena)	29.6/19.9	779.5	55
Quiché (La Perla)	31.2/11.0	3,228.0	140
Baja Verapaz (San Jeronimo)	27.9/13.8	1,581.6	91
Alta Verapaz (Sta Margarita)	25.6/13.9	2,056.0	138
El Peten (El Porvenir)	31.5/19.8	1,417.1	153
Guatemala (Nate Observ.)	24.2/14.6	1,398.7	125
El Progreso (Sanarate)	25.5/20.0	808.0	80
Sacatepequez (Florencia)	23.0/13.8	1,124.0	92
Chimaltenango (Los Aposentos)	21.3/ 9.0	968.1	85
Escuintla (Mauricio PMC)	33.9/21.3	825.4	39
Izabal (Pawnes Playitas)	30.7/21.8	1,383.9	132
Solola (Santo Tomas)	25.3/15.0	3,198.0	162
Zacapa (Pasabien)	33.3/20.6	867.4	75
Quezaltenango (Patzulin)	25.0/13.7	3,026.8	121
Suchitepequez (Las Nubes)	25.2/13.7	4,161.5	175
Retalhuleu (Las Delicias)	34.5/15.5	2,389.0	119
San Marcos (El Rosario)	25.9/17.6	5,885.8	213
Huehuetenango (Huehuetenango)	25.9/ 9.2	869.10	114
Chiquimula (Camotan)	32.2/19.9	1,477.20	125
Jalapa (La Ceibita)	28.5/14.0	897.2	101
Jutiapa (Asuncion Mita)	32.1/19.9	1,579.8	128

Location	Precipitation (millimeters)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Guatemala (Observatorio Nacional)	1	-	-	12	155	262	187	289	374	133	25	1
El Progreso (Sanarate)	-	-	-	-	201	189	82	130	83	91	32	-
Sacatepequez (Florenzia)	-	-	-	-	153	220	149	232	201	170	-	-
Chimaltenango (Los Aposentos)	-	-	2	3	-	248	-	332	235	116	30	1
Escuintla (Mauricio PHC)	1	-	-	315	509	-	-	-	-	-	-	-
Santa Rosa (La Morena)	780	-	2	-	-	242	249	287	-	-	-	-
Quiche (La Perla)	89	-	40	182	143	-	278	736	328	877	344	221
Baja Vera- Paz (San Jeronimo)	28	1	-	9	128	225	161	400	157	427	28	17
Alta Vera- Paz (Santa Margarita)	78	-	56	-	150	153	159	299	298	444	245	186
Peten (El Porvenir)	23	18	-	39	367	128	169	237	232	-	158	44
Izabal (Pawnes Playitas)	36	58	30	109	100	263	138	135	103	141	181	89
Solola (Santo Tomas)	2	-	1	149	364	510	529	777	412	386	60	8
Zacapa (Pasabien)	-	-	-	-	-	242	208	193	120	85	21	-
Quezaltenango (Patzulin)	-	35	15	-	509	847	579	-	-	719	227	95
Suchitepequez (Las Nubes)	-	-	14	263	791	623	497	1151	434	-	350	39
Retalhuleu (Las Delicias)	1	-	-	220	300	-	411	411	500	430	70	16
San Marcos (El Rosario)	-	18	48	434	584	779	607	957	851	940	583	85
Huehuetenango (Huehuetenango)	-	-	2	30	126	-	67	307	97	212	11	18
Chiquimula (Camotan)	-	-	1	30	197	492	227	144	136	190	57	4
Jalapa (La Ceibita)	-	-	10	2	50	251	-	184	180	198	21	2
Jutiapa (Asuncion Mita)	-	-	-	59	171	302	170	362	186	266	50	14

8.2 Landforms

42,000 sq.mi. in area, Guatemala extends 280 mi N-S from 17° 49' N to 13° 42' N, and 250 mi. E-W, from 92° 30' W to 88° 10' W. Bounded by Mexico on N and W, the Pacific Ocean in SW, El Salvador and Honduras in SE, the Caribbean sea in E and Belize in NE, its landforms result from the meeting of the Caribbean and North American plates (along Motagua-fault zone) and the subduction of the Cocos plate under the Caribbean plate along the Middle American trench off the Pacific coast. E-W ranges of the Antillean Mountain system, which extend eastward into the Caribbean as the greater Antilles island group, follow the juncture of North American and Caribbean plates; NW-SE trending Sierra Madre ranges, which include the Central American volcanoes most active in recent geologic time, belong to the Pacific Cordillera. There is great diversity of hills, plateaus, and mountains, dissected by a network of water-courses, with steep slopes especially common in central and western Highlands. Numerous rapid-flowing streams drain Pacific mountain slopes; large Caribbean rivers parallel Antillean ranges; their broad valleys extend Caribbean coastal lowlands deep into Eastern highlands.

The highlands constitute 50% of the total land area. Peten lowlands and the adjacent transitional zone between Peten and Altiplano, the Northern Slopes, make up another 40%. These northern regions are part of the vast limestone plain of the Yucatan Peninsula, which slopes from the Highlands along the Guatemala-Belize border (1,000-3,000' elevations) northward into the Gulf of Mexico. The region is characterized by an extensive underground drainage system; surface water takes the form of meandering north-flowing rivers and numerous small lakes and water-filled sinkholes. Swampy areas are common, especially along the rivers.

8.3 Land Uses

By Department

1. Chimaltenango, Solola, Totonicapan, San Marcos, El Quiche, Huehuetenango, and Quezaltenango, are dominated by contemporary Mayan communities; agriculture restricted to small family plots.
2. Escuintla, Santa Rosa, Suchitepequez, and Retalhuleu have few traditional Mayan communities. Indians are migrant workers or settled farmers.
3. El Progreso, Jutiapa, Chiquimula, and Zacapa are dominated by commercial agriculture surrounding Motagua River and tributaries; few Indians who do live here are either migrant laborers or new residents.

4. Guatemala and Sacatepequez, are dominated by the capital, and commercial interests.
5. Alta and Baja Verapaz are populated by varied Indian groups as subsistence farmers.
6. Izaba -- 20% covered by Lake Izabal; few traditional Indian groups. Commercial activity dominated by Puerto Barrios (Atlantic port of entry) and El Estor, a nickel mining area.
7. El Peten -- Subsistence agriculture with commercial activity limited to harvesting lumber, chicle, and rubber with migrant labor from neighboring departments.

Land Use, 1977
('000 hectares)

Arable land	1,450*
Land under permanent crops	350*
Permanent meadows and pastures	880*
Forests and woodland	5,800**
Other land	2,309*
Inland water	100
Total Area	10,889

* FAO estimate

** Unofficial figure.

Source: Europa Year Book 1980.

Land Distribution

312,800 of the smallest farms are on lots totaling 1,434,000 acres, or 4.55 acres per farm; many are less than 2 acres. 900 of the largest farms (fincas) cover 2,617,000 acres, or 2,900 acres per farm: almost exclusively on south coast and export oriented.

Soil Erosion

Severe soil erosion exists in the Western Highlands; population pressure forces greater cultivation of steep slopes and, combined with virtually no soil conservation practices, results in sheet, rill, and gully

erosion. In addition, out-migration to El Peten has intensified destruction of ground cover with consequent soil erosion. 1979 was declared the year of reforestation in an attempt to remedy the erosion and water loss problems.

8.4 Rivers/Coasts

Major Navigable Rivers

The Motagua River is the principal headstream. The Rio Grande rises in the department of El Quiche near Chichicastenango; its upper 120 miles are shallow and easily forded in the dry season. Flow and depth vary considerably with seasons; depths average between 6 and 15 feet, with lowest levels during April-May. Widespread flooding occurs in lower valley and delta during the rainy season. Lower 120 mi. are navigable at most times; river is paralleled by road and rail systems which link the coast and the capital. Polochic River Basin, which includes Lake Izabal, comprises Polochic river, rising in Alta Verapaz and flowing 149 mi. into Lake Izabal (25 mi. long, 12 mi. wide), the lake itself and its effluent, the Dulce River, which empties into the Caribbean at the Bahia de Amatique. Depths vary from 16-100' in Dulce River, 36-48' in Lake Izabal, and 4-16' in Rio Polochic. The Dulce and the lake are navigable year-round by small craft. The Polochic is navigable downstream from Panzos by boats of 8' draft and upstream by boats of 2-3' draft, except in very dry years.

Coasts.

Caribbean: Irregular, deeply embayed, 85 mi long. Sheltered Bahia de Amatique, into which Rio Sarstun and Rio Dulce empty, encompasses over half the coastline: Motagua River debouches into the Gulf of Honduras.

Pacific: 165 mi. long, broad coastal plain rimmed by tidal lagoons and marshes, sandbars at river mouths. Surf is sometimes heavy.

8.5 Mountains

Two major arcs of the Antillean system, each comprising 3 ranges, swing E-W across the country. The northern arc includes (W-E): Sierra de Los Cuchumatanes, with plateaus at 7,000-8000' elevations and individual peaks up to 12,000'; Sierra de Chama, highest elevation 8,600', and Sierra Santa Cruz, highest point 4,000'. Rio Selegua, Rio Salinas, and Rio

Polochic mark division between northern and southern arcs. Southern arc is made up of Sierra de Chuacas, Sierra de Las Minas, Montanas Del Mico. Altitudes range from 8,000' in the west, to 9,000-10,000' in Central Sierra de Las Minas, and 3,000-4,000' in east.

Pacific ranges, which constitute the backbone of the country and the water divide, contain the country's highest peaks. A chain of active volcanoes follows SW edge of High Plateau; in east, where elevations are lower, volcanic pattern is less regular. Elevations in west: plateaus 7,000-9,000', peaks up to 14,000'. Elevations in Central Sierra Madre are somewhat lower, with peaks ranging from 8,000-13,000'. Elevations in east drop to 3,000-4,000' with occasional volcanic cones rising to 6,000'.

8.6 Volcanoes

<u>Name</u>	<u>Height</u>	<u>Activity</u>	<u>Location</u>	<u>Last Erupt</u>
Tajumulco	13,812			
Tacana	13,335*			
Acatenango	12,992			
Fuego	12,582			
Santa Maria Quezaltenango	12,362			
Agua	12,310	(Destroyed the old city of Guatemala in 1541)		
Zunil	11,591			
Atitlan	11,565			
Pacaya	8,346			

*Given also as 13,976.

8.7 Seismicity

The quake of 2/4/76 occurred within the Motagua Fault Zone, the active boundary between Caribbean and N. American Plates. Future moderate to major quakes are most likely to occur near the ends of the fault: Guatemala City and Puerto Barrios.

The main fault (strike-slip type) in the Motagua Valley, (240 km. long) and is the most extensive surface rupture in the northern hemisphere since the San Francisco quake of 1960. Extending from Quebrados to Patzaj,

It comes within 25 km. of Guatemala City. Subsidiary faults and splays are scarce. Highly unusual secondary faults occurring 30 km. from main fault are rare for strike-slip types but deserve study because they pass through Guatemala City.

Seismic Areas

3 main areas: Cocos Plate thrusting under Caribbean Plate at depth of 50-250 km; at shallow depths beneath volcanoes, and source of many moderate-size quakes; fault system crossing central Guatemala, including Motagua Valley. Seismic gaps: from 1902 until 1976, Motagua Fault Zone relatively inactive; now, major gap on west coast of Central America between 88 and 91 degrees W. longitude. Data for quake: 7.5 on the Richter scale; 100,000 sq. km. area; epicenter focal depth at 120 km.

9. Transportation and Logistics

9.1 Road Network

Highway travel is the predominant transport mode. About 95% of cargo traffic and nearly all passenger traffic move by road. All major production and consumption centers, and principal ports are connected by the 2,800 km. paved road network; unpaved roads total 15,300 km. The average highway density for paved roads is 25.4 km./1,000 sq.km. of area; density is greatest in the Pacific lowlands and central Highlands, lowest in Peten and Atlantic departments. Only in the undeveloped areas of the Peten and the Franja Transversal del Norte are substantial highway extensions needed, but there is a serious shortage of all weather farm-to-market roads.

Major Routes:

Pacific Highway crosses Pacific coastal plains via Las Palmas, Coatepeque, Retalhuleu, Mazatenango, Escuintla, and Chiquimulilla to Salvadorean border.

Interamerican Highway extends from Mexican to Salvadorean borders, passing through central highlands and Guatemala City. Interoceanic Highway follows Motagua River valley, and crosses highlands via capital to Pacific port of San Jose.

Additional paved road systems connect capital and Jalapa with Jutiapa and San Salvador, El Salvador; join Zacapa and Chiquimula with San Salvador and with Interoceanic Highway: connect Quezaltenango with Tapachula, Mexico (E-W), and (N-S) with Champerico on Pacific Coast and San Cristobal on Interamerican Highway. A paved road runs north from El Progreso to Copan and continues unpaved to Flores on Lake Peten.

The road network was considerably damaged by the 1976 earthquake (U.S. \$48 million estimated cost); the Interoceanic Highway was closed for 6 weeks due to landslides and collapsed and damaged bridges. The Interamerican Highway between Antigua and the capital was also blocked by landslides.

Increased maintenance and rehabilitation of existing roads, and construction of feeder and penetration roads will be the likely future focus of the highway sector. Maintenance efforts, largely the responsibility of the General Directorate for Roads (DGC) under the Ministry of Communications and Public Works, have suffered from insufficient funding,

obsolescence of much of the DGC fleet, and a shortage of skilled workers and professional engineers. An estimated 64% of the network is in poor to fair condition.

9.2 Vehicles

Light vehicles make up 55-76% of the fleet; trucks 16-35%; buses 7-14%. (See also Host Resources.)

<u>Vehicle</u>	<u>Vehicle Fleet</u>		<u>Average Annual Growth Rate</u>
	<u>1966</u>	<u>1977</u>	
Automobiles	22,093	67,394	10.7%
Panel/Pick-up	17,899	49,503	9.7%
Trucks			
Trucks ^{1/}	6,538	18,026	9.7%
Buses	<u>2,879</u>	<u>13,308</u>	<u>14.9%</u>
Total	49,409	148,231	10.5%

1/ Includes minibuses

Source: World Bank, Highway Maintenance Project: Guatemala, April 1980.

9.3 Surface Miles

Four charts below give approximate distances in kilometers between 45 cities in Guatemala. The distance between 2 cities is found at the intersection of the row identified by one city and the column identified by the other. Distances are based on routes considered most convenient for the traveler.

Antigua, Guatemala														
198	Asuncion													
182	262	Champerico												
23	205	204	Chimaltenango											
205	96	389	215	Chiquimula										
107	134	229	129	201	Chiquimulilla									
179	359	86	203	381	226	Coatepeque								
203	253	330	197	227	294	315	Coban							
398	571	337	376	545	471	322	359	Comitan, Mexico						
103	94	269	113	161	41	266	252	488	Cuilapa					
108	122	289	118	96	172	286	130	450	132	El Progreso				
44	197	166	66	219	64	163	244	408	104	122	Escuintla			
249	128	430	259	50	235	427	278	598	195	147	265	Esquipulas		
211	152	392	221	55	259	389	222	542	219	102	227	108	Gualan	
40	156	221	50	164	104	218	189	425	64	67	56	210	Guatemala	
232	402	171	210	376	305	156	190	170	322	279	242	429	Huehuetenango	
136	60	317	146	80	167	314	192	512	127	61	152	114	Jalapa	
171	26	337	181	93	109	334	250	556	69	119	172	127	Jutiapa	
80	233	150	102	255	100	147	280	392	140	158	37	301	La Democracia	
237	417	144	246	436	284	59	243	352	324	342	221	485	Nalacatan	
117	297	66	139	319	164	63	299	308	204	222	101	385	Mazatenango	
288	244	469	298	147	351	466	296	616	311	179	304	200	Morales	
267	101	397	277	198	169	394	355	639	165	224	232	232	Nueva San Salvador*	
60	195	182	82	203	80	179	228	424	103	106	17	249	Palin	
38	220	191	16	228	144	188	210	361	128	191	81	274	Patzicia	
337	293	518	347	196	400	515	210	665	360	228	353	249	Puerto Barrios	
164	346	98	142	254	224	75	345	248	254	257	161	400	Quezaltenango	
143	323	40	165	345	190	47	239	298	230	248	127	391	Retalhuleu	
180	341	200	158	315	285	185	289	231	270	218	222	368	Sacapulas	
137	187	318	131	161	228	315	129	385	188	64	180	214	Salama	
94	108	275	104	110	158	272	65	464	116	13	110	162	Sanarage	
93	246	215	115	268	113	212	144	457	253	171	50	314	San Jose	
37	180	218	31	188	128	215	203	406	88	91	80	234	San Juan Sacatepequez	
177	86	258	187	39	193	355	165	553	153	102	193	73	San Luis Jilotepeque	
214	396	133	192	404	273	48	233	298	304	307	210	450	San Marcos	
304	474	243	282	448	377	228	289	242	394	351	314	501	San Rafael La Indep	
218	115	411	291	212	188	408	262	653	179	238	246	246	San Salvador*	
214	48	360	224	145	132	357	369	599	112	171	195	179	Santa Ana	
180	312	150	108	320	235	135	179	281	220	223	172	366	Santa Cruz Del Quiche	
77	230	132	99	252	97	130	274	375	137	155	34	298	Santa Lucia Cotzumal	
303	353	430	297	327	394	415	99	461	354	230	346	380	Sebol	
94	276	170	72	284	189	155	225	315	184	187	126	330	Solola	
252	432	159	274	464	299	74	369	378	339	357	236	500	Tapachula, Mexico	
138	320	116	116	328	243	101	213	261	228	231	180	374	Totonicapan	
180	121	361	190	24	228	358	202	522	128	71	196	772	Zacapa	

Gualan														
170	Guatemala													
371	259	Huehuetenango												
136	97	343	Jalapa											
149	132	290	57	Jutiapa										
261	92	226	286	208	La Democracia									
445	276	186	370	392	205	Malacatan								
325	156	142	250	272	85	119	Mazatenango							
91	249	447	228	243	340	522	404	Morales						
254	228	473	162	130	268	450	332	348	Nueva San Salvador*					
209	40	258	134	171	53	235	117	288	246	Palin				
234	65	195	159	196	114	229	126	313	290	97	Patzicia			
140	298	496	277	292	389	272	453	58	395	337	362	Puerto Barrios		
360	191	82	285	322	145	103	61	439	390	177	127	486	Quezaltenango	
351	182	132	176	298	111	103	27	430	356	143	152	477	51	Retalhuleu
310	207	62	280	338	206	213	171	386	432	238	143	433	111	Sacapulas
156	125	216	126	186	216	367	253	232	289	164	146	279	265	Salama
116	55	295	47	107	146	328	210	195	210	94	119	242	245	Sanarate
274	105	291	199	221	86	268	150	353	279	66	130	400	210	San Jose
194	25	240	119	156	116	271	153	273	250	64	46	320	172	San Juan Sacatepequez
95	138	384	40	85	229	411	293	189	188	177	202	236	328	San Luis Jilotepeque
410	241	132	335	372	194	53	110	489	439	226	177	536	51	San Marcos
443	331	73	413	462	298	256	214	519	543	330	267	566	154	San Rafael La
268	242	487	176	144	282	464	346	362	13	262	306	409	406	San Salvador*
201	175	433	109	77	231	413	295	295	52	211	239	342	355	Santa Ana*
326	157	112	251	288	156	162	121	405	382	188	93	452	61	Santa Cruz Qui
258	89	209	183	205	18	186	68	337	263	50	97	384	128	Santa Lucia Cotzumal
322	291	292	292	352	382	343	401	398	455	330	312	445	341	Sebol
290	121	149	215	252	110	183	122	369	346	142	57	416	81	Solola
460	291	212	385	407	220	25	136	539	465	252	257	586	131	Tapachula, Mex
334	165	95	259	296	164	129	87	413	390	195	101	460	27	Totonicapan
30	141	353	109	107	232	414	298	124	223	180	205	171	331	Zacapa

Retalhuleu														
161	Sacapulas													
279	153	Salama												
236	232	80	Sanarate											
176	269	229	159	San Jose										
179	186	101	79	127	San Juan Sacatepequez									
319	321	169	90	240	162	San Luis Jilotepeque								
94	159	315	295	257	222	378	San Marcos							
204	132	288	367	361	312	456	202	San Rafael La Independencia						
372	446	305	226	293	266	204	453	559	San Salvador*					
321	379	238	159	242	199	137	402	505	68	Santa Ana*				
111	49	205	211	219	138	294	109	184	398	329	San Cruz Del Quiche			
94	187	213	143	81	113	226	175	281	279	226	139	Santa Lucia Cotzumal		
391	229	167	246	393	267	335	389	364	471	402	281	376	Sebol	
131	95	202	178	172	102	258	129	221	362	293	47	93	325	Solola
120	239	388	345	283	288	428	79	284	481	428	191	203	469	211 Tacachula
77	83	239	219	227	146	202	75	167	406	337	35	147	313	55 Totonicapan
322	290	138	87	243	165	66	379	425	239	170	297	229	302	261 Zacapan

Tacachula, Mexico
 157 Totonicapan
 431 303 Zacapa

* El Salvador

Note: City names which never appeared entirely on the chart: Santa Lucia Cotzumalguapa

9.4 Railroad Network

While the highway system has been rapidly expanding, railroads have been in decline. Rail freight traffic has stagnated at 1964 level of about 650,000 tons annually, passenger traffic at about 1.7 million trips. The decline is expected to continue.

The system totals nearly 1,000 mi., most of it government-owned and operated (see Ports). The main line runs from Puerto Barrios to Guatemala City and San Jose on the Pacific Coast. Branch lines run from the vicinity of Masagua west along Pacific Coast to Tecun Uman on the Mexican border; from Zacapa south to Salvadorean border; and from Puerto Barrios to Santo Tomas de Castillo.

9.5 Rail Carriers

Ferrocarriles de Guatemala -- FEGUA: Avda. 18-03, Zona 1, Guatemala City; 1,782 km. open from Puerto Barrios and Santo Tomas de Castillo on the Atlantic coast to Tecun Uman on the Mexican border, via Zacapa, Guatemala City and Santa Maria. Br. lines: Santa Maria -- San Jose; Las Cruces -- Champerico. From Zacapa another line branches southward to Anguatu, on the border with El Salvador; owns the ports of Barrios (Atlantic) and San Jose (Pacific).

Verapaz Railway: Livingston, Izabal; 46.4 km. Panzos-Pancajche; serves the coffee district.

9.6 Ports

Ports handle 90% of the country's international trade, the Central American Common Market being the major exception. Two Atlantic ports, Puerto Barrios and Santo Tomas de Castillo, both on the Bay of Amatique, are controlled by FEGUA; they also handle cargo for El Salvador. Less than 10 km. apart, they tend to be complementary in activity: Santo Tomas a general cargo port (annual traffic of over one million tons); Puerto Barrios, an agricultural commodities port (traffic reduced 50% by earthquake damage to 330,000 tons annually). Rehabilitation construction of the latter is expected to be completed by late 1981. Two lighterage ports on the Pacific, Champerico and San Jose, are considered inadequate. The construction of a deepwater Pacific coast port has been the subject of numerous studies; alternatively, San Jose may be expanded.

Champerico

Lat: 14° 18' N.; long: 91° 56' W.

Accommodation -- Open roadstead subject to heavy swells. Anchorage in approx. 13.10 m, 1.6 km from wharf. Cargo loaded and discharged by lighters. Pier, length 345 m, width 24.38 m, head 24.99 m, bridge 3.23 m. Eleven 30-ton lighters. 2,000 m. railway, four locomotives, 150 car platforms.

Storage: 23 covered warehouses, 35,100 cu. m. Open and paved warehouses with total area of 30,000 sq.m.

Cranes: Two 10-ton, two 15-ton and one 25-ton winch (max. capacity 40 tons). 15 truck lifts and 7 cranes of different tonnage.

Bunkers -- Not available.

Development -- The existing port facilities being developed; an inland turning basin with access channel and breakwater being built.

Shiprepairs -- Not available.

Towage -- Four tugs.

Pilotage -- Not compulsory and not necessary.

Airport -- Retalhuleu, 32 km. N.W.

Livingston

Lat. 15° 49' N.; long. 88° 52' W. On the Río Dulce.

Accommodations -- Depth at entrance, 3.05 m, on bar 1.52 to 2.44 m and alongside wharf 1.52 to 1.83 m. Vessels drawing more than 1.98 m anchor 2 miles out, in 4 to 9 fms. Two wharves suitable only for lighters. Cargo landed by lighters of 80 tons. Municipal wharf at Customs House. Two docks, on 40.84 m by 20.42 m and the other 15.24 m by 9.75 m.

Private Wharf: One private wharf available.

Bunkers -- Not available.

Pilotage -- No pilots available.

Puerto Barrios

Lat. 15° 43' N.; long. 88° 36' W.

Approach -- Depth in channel approach 9.75 m. Good anchorage SW of the pier with 9 m. of water.

Tides: R. of T. less than 30.48 cm.

Accommodation -- One pier 304.8 m. long, property of Ferrocarriles de Guatemala, with one inner berth, depth 7.62 m. at outer end, 6.40 m. at inner end. On south side of approach to the pierhead, one outer berth with 7.01 m. and one inner berth with 4.88 m. depth.

Cranes: No cranes on pier but 15-ton mobile crane and 5-ton crawler crane available in yards; 40-ton crawler crane available on special request.

Container and Ro/Ro Facilities -- Containers can be handled by ship's tackle to flat cars on wharf alongside vessels.

Ore and Bulk Cargo Facilities -- Available for grains, copper ore concentrate, and fertilizers.

Bunkers -- Bunker, petrol and diesel oil available.

Shiprepairers -- Ferrocarriles de Guatemala may be able to handle small repairs.

Towage -- Optional.

Pilotage -- Compulsory. Launch available for handling lines.

Airport -- 1.6 km.

San Jose
Lat. 12° 55' 10" N.; long. 90° 50' W.. 170 kms. S. of
Guatemala City, on the Pacific Coast

Approach -- Open roadstead; ships anchor about 0.5 km from pierhead in about 14.5 to 16.5 m; sandy bottom, not very good holding ground. Call port on VHF channel 16.

Weather: Infrequent heavy swells; from the middle of June until October, violent wind and rain storms of short duration, called "Chubascos," may occur, particularly at night.

Accommodation -- Steel pier owned by Ferrocarriles de Guatemala (FEGUA), but operated by Agencia Marítima S.A., serves lighters loading/discharging vessels in the roads. Three 5-ton winches and one heavy-duty winch of 20 tons capable of handling up to 22 short tons, with previous notice. Nine lighters of 35 tons capacity each; four tugs and one dispatch boat.

Container and Ro/Ro facilities -- 20 ft. containers can be handled.

Bunkers -- Unavailable.

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9. Transportation and Logistics

Santo Tomas De Castillo
Lat. 15° 41' 44" N.; long. 88° 37' W.

Approach -- Situated in a well-protected bay with good anchorage. Controlling depth at entrance (Villedo Lighthouse, about 2 1/2 miles distant), 7.92 m. Depth in dredged channel 9.75 m, in turning basin 9.14 m.

Accommodation -- Depth of wharf 10.06 m. Six ships up to 10,000 tons each can maneuver at the same time. Pier 914.4 m long.

Storage: Warehouse area of 35,018 sq. m. and uncovered storage space and circulation area of 143,275 sq. m.

Cranes: Stiff-leg crane on pier to lift maximum of 55 tons and portal crane of 35 tons lifting capacity.

Container and Ro/Ro Facilities -- A portal crane on rails is available for handling containers and has a capacity of 35 tons.

Ore and Bulk Cargo Terminal Facilities -- Special equipment is available. Sugar can be handled at the rate of 100 tons/hr. Ore is mostly handled by "clam-shell" trucks and pay-loaders.

Towage -- Optional.

Pilotage -- Compulsory.

Airport -- Puerto Barrios, 8 km.

9.7 Shipping Lines

Service From:

New York and north Atlantic ports

United Fruit Co.

New Orleans and Gulf ports

Flota Mercante
Grancolombiana
Lykes Caribbean Line
Standard Fruit & S.S. Co.
United Fruit Co.

San Francisco and Pacific Ports

Grace, Independence & Lloyd
Lines

Guatemala

9. Transportation and Logistics

Charleston and Baltimore

Costa Rica Line

Canada

Swedish American Line

U.K.

Royal Mail Line

Services are provided by French, German, and Dutch Lines from the continent.

Domestic Lines:

Armadora Maritima Guatemalteca S.A.: 7A Avda. 16-45, Apdo. 1008, Zona 1, Guatemala City; cargo services:

Flota Mercante Gran Centroamericana, S.A.: 1A Calle 7-21, 5°, Zona 9, Guatemala City; services from Europe (in association with WITASS), Gulf of Mexico, U.S. Atlantic and East Coast Central American ports, and from the Far East to West Coast Central American ports, in association with Japanese lines.

Lineas Maritimas de Guatemala, S.A.: 3A Calle 6-11, Apdo. 1485, Zona 9, Guatemala City; cargo services.

9.8 Airports

Air transport is particularly important in agricultural and tourist sectors. Regular air service is necessary for transport of goods and passengers to remote areas like Peten. 381 usable airfields: 7 with permanent-surface runways, 17 with runways over 1,220 m; 1 seaplane station. La Aurora Airport, Guatemala City, considered best in Central America, can accommodate jet aircraft. Rainy season may limit use of smaller airfields.

Development plans for 1977-82 period include construction of a new airport at Santa Elena in the Peten and the first phase of upgrading La Aurora airport.

NB: For up-to-date information consult latest issue of weekly International NOTAMS, International Flight Information Manual, and/or ICAO's air navigation plan for appropriate region.

Runway Characteristics

<u>Location</u> <u>Coordinates</u>	<u>Eleva- tion M/ Temp C</u>	<u>Nr/Type</u>	<u>Slope %</u>	<u>Aircraft/ Length M</u>	<u>CL</u>	<u>Aircraft/ Strength (1,000 Kg)</u>	<u>Fuel/ Octane</u>
Champerico 14° 18' N 91° 50' W	N/A	N/A	N/A	N/A	N/A	N/A	100

Remarks: Longest runway 3,600', not hard surfaced

Aids: VFR only.

Runway Characteristics

<u>Location</u> <u>Coordinates</u>	<u>Eleva- tion M/ Temp C</u>	<u>Nr/Type</u>	<u>Slope %</u>	<u>Aircraft/ Length M</u>	<u>CL</u>	<u>Aircraft/ Strength (1,000 Kg)</u>	<u>Fuel/ Octane</u>
Guatemala/ La Aurora 14° 34' 55" N 90° 31' 39" W	1506 23.7	01/19	0.87	2987	A	AUW 160/4	100, JA1

Remarks: Alternate Aerodromes; Cozumel/Intl, Managua/Las Mercedes, Merida/Lic. Crescencio Rejon Intl, Mexico/Lic. Benito Juarez Intl, San Salvador/Ilopango Intl.

Aids: DME, VOR, AV(01+), R, L4, L5, L9, LTX, B, LO, D, MC, T, MTD, S, MTX, MO. No Telex.

Runway Characteristics

<u>Location</u> <u>Coordinates</u>	<u>Eleva- tion M/ Temp C</u>	<u>Nr/Type</u>	<u>Slope %</u>	<u>Aircraft/ Length M</u>	<u>CL</u>	<u>Aircraft/ Strength (1,000 Kg)</u>	<u>Fuel/ Octane</u>
Melchor de Mencos 17° 03' N 89° 09' W	348	N/A	N/A	N/A	N/A	N/A	None

Remarks: Longest runway 3,000', not hard surfaced. No air-ground communications.

Runway Characteristics

<u>Puerto Barrios/ Location</u>	<u>Eleva- tion M/ Temp C</u>	<u>Nr/Type</u>	<u>Slope %</u>	<u>Aircraft/ Length M</u>	<u>CL</u>	<u>Aircraft/ Strength (1,000 Kg)</u>	<u>Fuel/ Octane</u>
15° 44' N 88° 35' W	2 30.1	12/30	0.56	1800	B	AUW 41	100

Remarks: No alternate aerodromes listed by ICAO.

Aids: L4, MD, MC, MT. 3 hour advance notice for fuel. No Telex.

Runway Characteristics

<u>San Jose/ Location</u>	<u>Eleva- tion M/ Temp C</u>	<u>Nr/Type</u>	<u>Slope %</u>	<u>Aircraft/ Length M</u>	<u>CL</u>	<u>Aircraft/ Strength (1,000 Kg)</u>	<u>Fuel/ Octane</u>
13° 55' 50" N 90° 50' 07" W	8 30.3	15/33	0.16	1574	B	AUW 41	100

Remarks: No alternate aerodromes listed by ICAO.

Aids: L4, MD, MC, MT. No Telex.

* KeyRadio Aids

ILS - Instrument Landing System
DME - Distance Measuring Equipment
VOR - VHF Omni-Directional Range

Lighting Aids

PA - Precision Approach Lighting System
SA - Simple Approach Lighting System
VA - Visual Approach Slope Indicator System
AV - Abbreviated Approach Slope Indicator System
R - Runway Edge, Threshold & Runway End Lighting
LC - Runway Center Line Lighting

- LTD - Runway Touchdown Zone Lighting
- LTX - Taxiway Lighting
- B - Aerodrome or Identification Beacon
- LO - Obstruction Lighting

Marking Aids

- D - Runway Designation Markings
- MC - Runway Center Line Markings
- T - Runway Threshold Markings
- MTD - Runway Touchdown Markings
- S - Runway Sidestripe Markings
- FD - Fixed Distance Markings
- MTX - Taxiway Center Line & Holding Position Markings
- MO - Obstruction Markings

Additional Aids (L)

1. Portable Runway Lights (Electrical)
2. Boundary Lights
3. Runway Flood Lights
4. Low Intensity Runway Lights
5. Low Intensity Approach Lights
6. High Intensity Runway Lights
7. High Intensity Approach Lights
8. Sequenced Flashing Lights
9. Visual Approach Slope Indicator (VASI)
(An asterisk (*) preceding the element (*L4) indicates lighting available on prior request by phone, telegram, etc.)

9.9 Personal Entry Requirements

Passport required.

Visa required; however, tourist cards may be used in place of a visa for up to 6 months. No vaccinations required.

9.10 Aircraft Entry Requirements

All private and non-scheduled commercial aircraft overflying or landing for commercial or non-commercial purposes must obtain prior

permission from the Directorate General of Civil Aeronautics, La Aurora Airport, Guatemala City, Guatemala (Telegraphic address: DAEROCIVIL GUATEMALA/Telex: None) at least 24 hours in advance. Requests must include: type of aircraft and registration marks, aircraft owner, origin and destination of flight, date and time of landing or overflight, name of pilot and co-pilot, purpose of flight, number of passengers, and type and amount of cargo.

A response to the request will not be received unless permission is denied or unless restrictions are placed upon the flight. If no response is received within 24 hours, the requestor may assume that permission is granted. If a definite answer to the request is desired, the requestor must include provision for pre-paid reply. A copy of the request should be kept and carried along on the flight to prove that the request has been sent.

9.11 Airlines

Aviateca -- Empresa Guatemalteca de Aviacion: Avda. Hincapié; Aeropuerto "La Aurora", Zona 13, Guatemala City: internal services and external services to El Salvador, Honduras, Mexico, and U.S.A.: fleet: 2 BAC 111-500, 2 DC-6A, 2 DC-3, 3 Fokker F27, and 4 Convair CV-340.

Foreign Airlines -- The following foreign airlines also serve Guatemala: Air Panama, Iberia (Spain), KLM (Netherlands), Mexicana de Aviacion, Pan Am (U.S.A.), Sabena (Belgium), SAHSA (Honduras), SAM (Colombia), TACA (El Salvador).

9.12. Air Distances

From Guatemala City to:

	<u>Statute Miles</u>
Houston	1,382
Managua	338
Mexico City	655
Miami	1,022
New Orleans	1,073
San Francisco	2,535
San Salvador (El Salvador)	113
Tegucigalpa (Honduras)	225

10. Power and Communications

10.1 Electric Power

About 60% of Guatemala's installed capacity is thermally generated. A large hydroelectric potential (4,300 MW) could supply all power needs. When fully operational in 1983, two hydropower projects receiving IBRD funding, Aguacapa (90 MW) and Chixoy (300 MW), will reduce share of oil-fired plants to about 30%. Due to its high sulfur and paraffin content, domestic oil produced so far cannot be processed in Guatemala's refinery, nor are potential geothermal reserves at present economically exploitable for power generation.

The National Electricity Institute (INDE) is mainly responsible for generating power and the Guatemala Electricity Enterprise (EEG) for its distribution. Numerous small private and municipal utilities and self-producers add to the supply. The total generating capacity of 492 MW in 1978 included 314 MW (64%) from the inter-connected system; 16 MW (3.3%) from isolated INDE, privately and municipally-owned utilities; 161 MW (32.7%) from miscellaneous producers.

Gross energy consumption, though growing, is well below Central American average; per-capita consumption about 188 kWh in 1975. Consumption in the area of Guatemala City is about 14 times greater than in the rest of the country. Only about 20% of the population received electric service in 1976 when industry accounted for 47% of total consumption, residential for 26%, commerce and government for 27%. Electricity supply is AC, 60 cycles, 100-220 V.

Plants	<u>Installed Capacity</u>			<u>1/ Generation</u> ^{2/}
	(MW)	(MW)	(MW)	(GWh)
INDE				
Hydro				
Small (various)	96	96	96	293
Aguacapa				
3 x 30 MW	88 ^{3/}	88	395	
Chixoy				
5 x 60 MW			270 ^{3/}	1720
Sub-total	96	184	454	2408

	<u>Installed Capacity</u> ^{1/}			<u>Generation</u> ^{2/}
	(MW)			(GWh)
	<u>1978</u>	<u>1979</u>	<u>1982</u>	
Thermal				
Escuintla I (Steam)	33	33	33	
Escuintla II (Steam)	53	53	53	
Escuintla I & II (Gas)	30	30	30	
Escuintla III & IV (Gas)	50	50	50	
San Felipe (Diesel)	2.5	- ^{4/}	-	
Melendres (Diesel)	1.5	- ^{4/}	-	
Puerto Barrios (Diesel)	3.0	3.0	3.0	
Sub-total	<u>173.0</u>	<u>169.0</u>	<u>169.0</u>	
Total INDE	<u>269.0</u>	<u>353.0</u>	<u>623.0</u>	

EEG

Thermal				
Laguna I & II (Steam)	7 ^{4/}	-	-	
Laguna II & III (Steam)	26 ^{5/}	-	-	
Laguna I (Gas)	12 ^{4/}	-	-	
Laguna II & III (Gas)	40 ^{5/}	-	-	
Laguna I (Diesel)	4 ^{4/}	-	-	
La Castellana I (Diesel)	5 ^{4/}	-	-	
Combined Cycle Plant (Gas II & III with Steam II & III)		60	60	
Total EEG	<u>60</u>	<u>60</u>	<u>60</u>	
Total Sector	329	413	683	

- 1/ At year-end
- 2/ Average Annual
- 3/ Firm Capacity
- 4/ Retired at year-end
- 5/ In combined Cycle Plant (Net 60 MW)

Source: World Bank, Guatemala: Chixoy Power Project, June 1978.

10.2 Telecommunications

A government-owned and operated organization, Guatemala Telecommunications (Guatel) is responsible for national and international communications, including connections into Central American Microwave Net. Despite recent telephone system expansion, telephone density is next-to-lowest in Central America (8.25 lines per 1,000 inhabitants).^{*} Modern facilities are available only in Guatemala City; concentration of telecommunications in the capital limits development in rural areas. (92.7% of telephones in capital, remainder in other major cities.) There are telephone connections with El Salvador and Mexico. Telegraphic services are widely available in the country, with connections to Mexico and the rest of Central America.

The 1976 earthquake damaged central switching stations and private installations as well as Guatel telegraph facilities. Emergency radio relay stations were used to restore basic communications.

^{*} 70,600 telephones in 1980.

10.3 Radio Network

Dirección General de Radiodifusión y Televisión Nacional: 5A, Avda. 13-18, Zona 1, Guatemala City; Government supervisory body.

There are 5 government and 6 educational radio stations, including:

La Voz de Guatemala: 5A Avda. 13-18, Zona 1, Guatemala City; Government station.

Radio Cultural TGN-TGNA: 4A Avda. 30-09, Zona 3, Apdo. 601, Guatemala City; religious and cultural station; programs in Spanish and English, Quiche and Queqchi.

There are 77 commercial stations of which the most important are:

Emisoras Unidas De Guatemala: Ruta 4, No. 6-32, Apdo. 1466, Zona 4, Guatemala City.

La Voz de las Americas: 11 Calle 2-69, Zona 1, Guatemala City.

Radio Cinco Sesenta: 6A Avda. 12-15, Zona 1, Guatemala City.

Radio Continental: 13 Calle 9-31, Zona 1, Guatemala City.

Radio Nuevo Mundo: 6A Avda. 10-45, Zona 1, Apdo. 281, Guatemala City.

Radio Panamericana: Km. 12, Carretera Roosevelt, Guatemala City.

In 1978 there were 280,000 radio receivers.

10.4 Television

Radio-Television Guatemala, S.A.: 30A Avda. 3-40, Zona 11, Apdo. 1367, Guatemala City; commercial station.

Tele Once: 10 Calle 5-02, Zona 10, Guatemala City; commercial.

Televiscentro-Canal 7: 3A Calle 6-24, Zona 9, Apdo. 1242, Guatemala City; commercial station channel 7

Trecevision S.A.: 3A Calle 10-70, Zona 10, Guatemala City; commercial.

In 1978 there were 150,000 television receivers.

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