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/4. Public

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INTRODUCTION

For the third time in less than 4 years, Central America has been struck by a great natural disaster. On 22 and 23 December 1972, a series of violent earthquakes practically destroyed the city of Managua, Nicaragua;1/ between 18 and 20 September 1974, a hurricane ravaged wide geographical zones of Guatemala and El Salvador and, most especially, Honduras.2/ Now, a strong and prolonged seismic phenomenon, which occurred between 4 and 6 February 1976 has once again struck the three countries, causing tremendous damage in Guatemala. Twenty-three thousand deaths, about 75,000 wounded - many seriously - and great material damage have been recorded to date.

The international community was moved by this catastrophe and immediately reacted by offering to contribute with every kind of aid to the efficient work undertaken by the Guatemalan National Emergency Committee which had begun to provide immediate aid to the hundreds of thousands of victims. As part of this display of world solidarity, the group of Latin American permanent ambassadors to the United Nations requested the Secretary-General of the United Nations to make a universal appeal for aid to Guatemala, and at the same time, with the consent of the Government of that country, to convene a meeting of the Committee of the Whole of the Economic Commission for Latin America where the magnitude of the disaster could be studied and recommendations adopted on the international technical and financial

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1/ See ECLA, Report on the damage of the earthquake occured in the City of Managua and its adverse effects on the Nicaraguan economy (E/CN.12/AC.64/2/Rev.1), 13 January 1973.

2/ See CEPAL, Informe sobre los daños y repercusiones del huracán Fifí en la economía hondureña (E/CEPAL/AC.67/2/Rev.1), 17 October 1974.

/co-operation which

co-operation which might be provided to Guatemala to help in the rehabilitation and reconstruction of the damage caused by the earthquake.3/

This document provides information to guide the work of the Committee should it be convened and, in more general terms, to provide Member Governments of the Economic Commission for Latin America with extra information on the magnitude of the disaster. It is based on the report on the earthquake prepared by the Secretaría General del Consejo Nacional de Planificación Económica de Guatemala,4/ and on the observations of a mission from the Office of the Executive Secretary of ECLA, which was in Guatemala from 6 February.

This report includes a description of the characteristics of the earthquake, an assessment of the deaths and material costs it caused, and a study of the main repercussions on the Guatemalan economy. It ends with some suggestions and recommendations which might orient, facilitate and indicate priorities for international co-operation to smooth over the difficult circumstances in which Guatemala finds itself because of the earthquake.

3/ The same was done in the extraordinary sessions of the Committee of the Whole for the disasters which occurred in Peru (22-23 July 1970), Nicaragua (16-18 January 1973), and Honduras (21-22 October 1974).

4/ See, Secretaría General del Consejo Nacional de Planificación Económica, Evaluación de los daños causados por el terremoto, su impacto sobre el desarrollo económico y social, y lineamientos para un programa inmediato de reconstrucción, Guatemala, February 1976.

I. CHARACTERISTICS OF THE EARTHQUAKE AND ACTION IMMEDIATELY TAKEN

1. Characteristics, origin and intensity of the earthquake

Recent discoveries related to the tectonics of the earth explain the origin of the earthquake which severely affected Guatemala - and to a lesser degree Honduras, and El Salvador - during the first half of February 1976. They indicate that the lithosphere, or external crust of the earth, is formed by a dozen rigid plates which move in known directions. When the plates move, they press against one another with volcanic and seismic results.

The recent disaster in Guatemala was caused precisely by a displacement of the so-called Caribbean plate - which moves in an easterly direction - with regard to the North American and Cocos plates (see figure 1 for the location, extension and relative movement of these plates). The earthquakes which have been occurring since February 4 are attributed to this displacement, which occurred along the Motagua fault, which crosses Guatemala in a west-northeast direction and continues into the Caribbean. The epicentres of the earthquakes were therefore located in the surroundings of and along that fault, although the shaking they caused activated other epicentres and provoked displacements of other faults of smaller extension and importance. (See figure 2.)

The displacement of the Caribbean plate seems to have been so great - some reports indicate up to 1 metre - that it caused earthquakes whose intensity reached 7.5 on the Richter scale in some places on 4 February and slightly over 6.0 on 6 February. Throughout this period, the seismographs registered intense activity, with hundreds of weaker earth movements daily, some of which could be attributed to the secondary centres mentioned in the previous paragraph.

/Figure 1

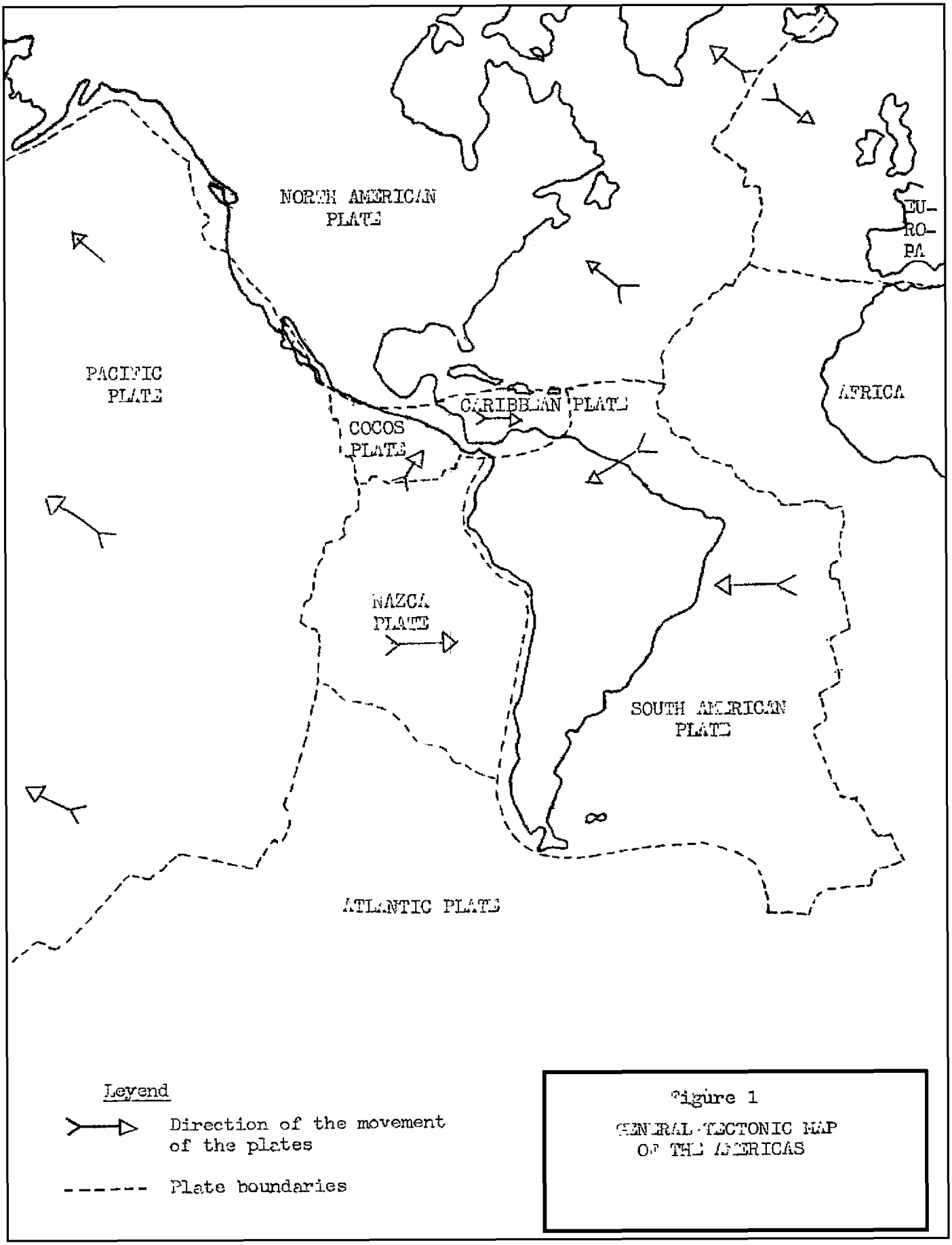

Figure 1

GENERAL TECTONIC MAP OF THE AMERICAS

/Figure 2

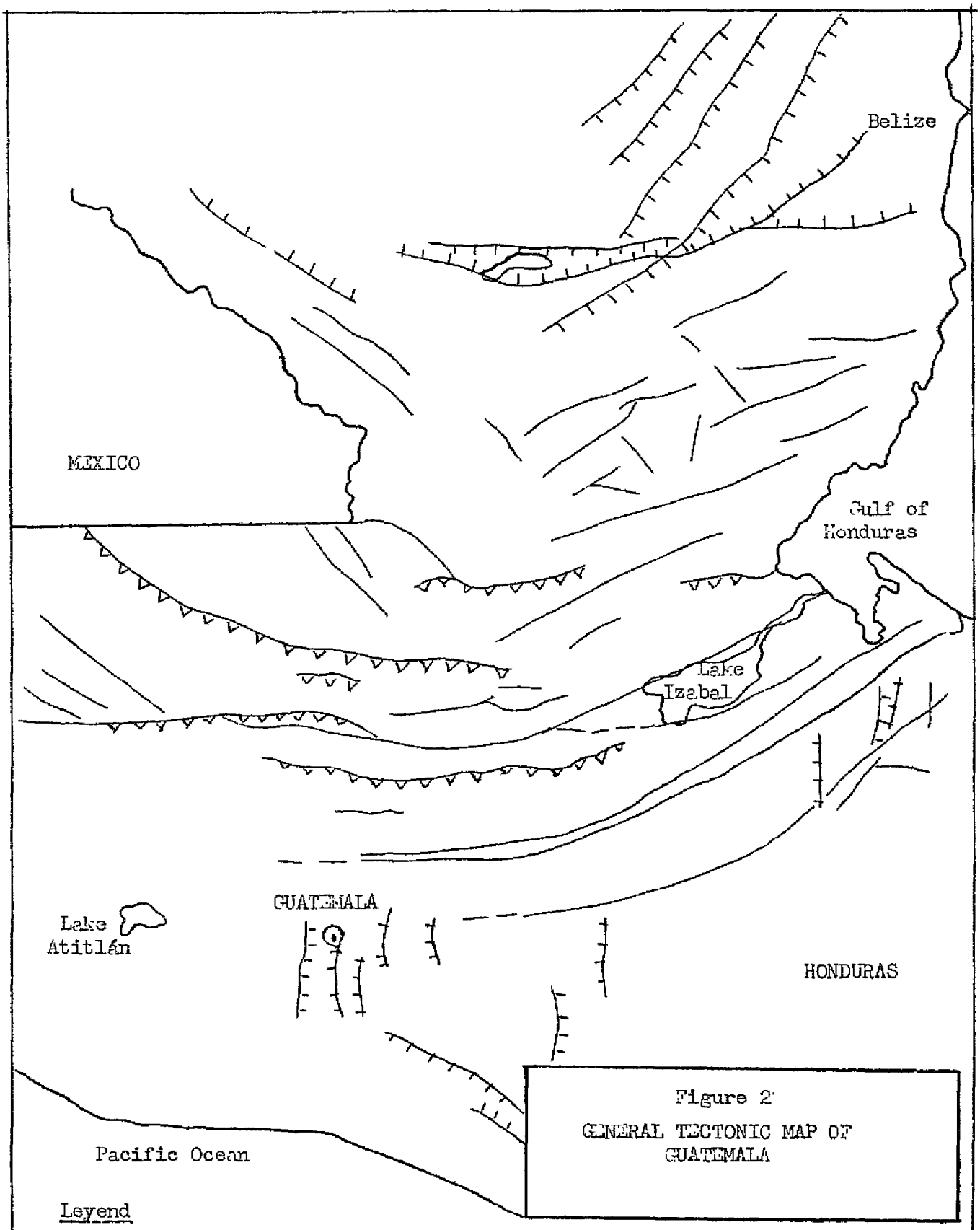

Figure 2

GENERAL TECTONIC MAP OF GUATEMALA

Leyend

——— Fault of unspecified type

———— Normal fault: the perpendicular lines indicate the lower side

———— Inverse and running fault: the triangles indicate the lifted side

Source: Metallogenetic Map, Icaiti, 1969.

/It should

It should be pointed out here that, with the exception of the earthquake of 1973 which seems to have been due to the same cause, there is no record of similar displacements of the Caribbean plate giving rise to earthquakes or seismic movements of the magnitude of the one which has just occurred. The earthquakes and seismic movements of less intensity on which information exists seem to have originated in epicentres located on the Pacific coast and to have been caused by pressures and displacements of the Cocos plate. This circumstance, and the well-founded supposition that the last tremors - less strong and less frequent - originated in centres located in places far from the Motagua fault, give grounds to suppose that in the near future earth movements of similar strength to those of the period of 4 to 6 February will not recur. The detailed scientific analysis - currently underway - of the seismological information collected recently will make it possible to endorse or correct this supposition.

With regard to the consequences of the earthquake, a third of the territory of Guatemala was affected, in varying degrees. The most severely damaged zones were the centre and east of the country, with a close relation between them and their proximity to the Motagua fault and other associated neighbouring faults.

As may be observed from figure 3, prepared on the basis of the data on housing destroyed, the four regions worst hit - with damage of between 70 and 100 per cent - are the Departamentos of Chimaltenango, El Progreso, Baja Verapaz y Zacapa. The Departamentos of Sacatepéquez, Guatemala, Quiché, Izábal and Totonicapán were also seriously damaged. Less serious damage was recorded in the departamentos of Sololá, Chiquimula, Jutiapa and Santa Rosa.

Among the most damaged - in other words, wholly or virtually destroyed - towns and villages are San Juan and San Pedro Sacatepéquez in the departamento of Guatemala; el Jícaro and El Progreso, in El Progreso; Sumpango and Santo Domingo Xenacoj, in Sacatepéquez;

/Figure 3

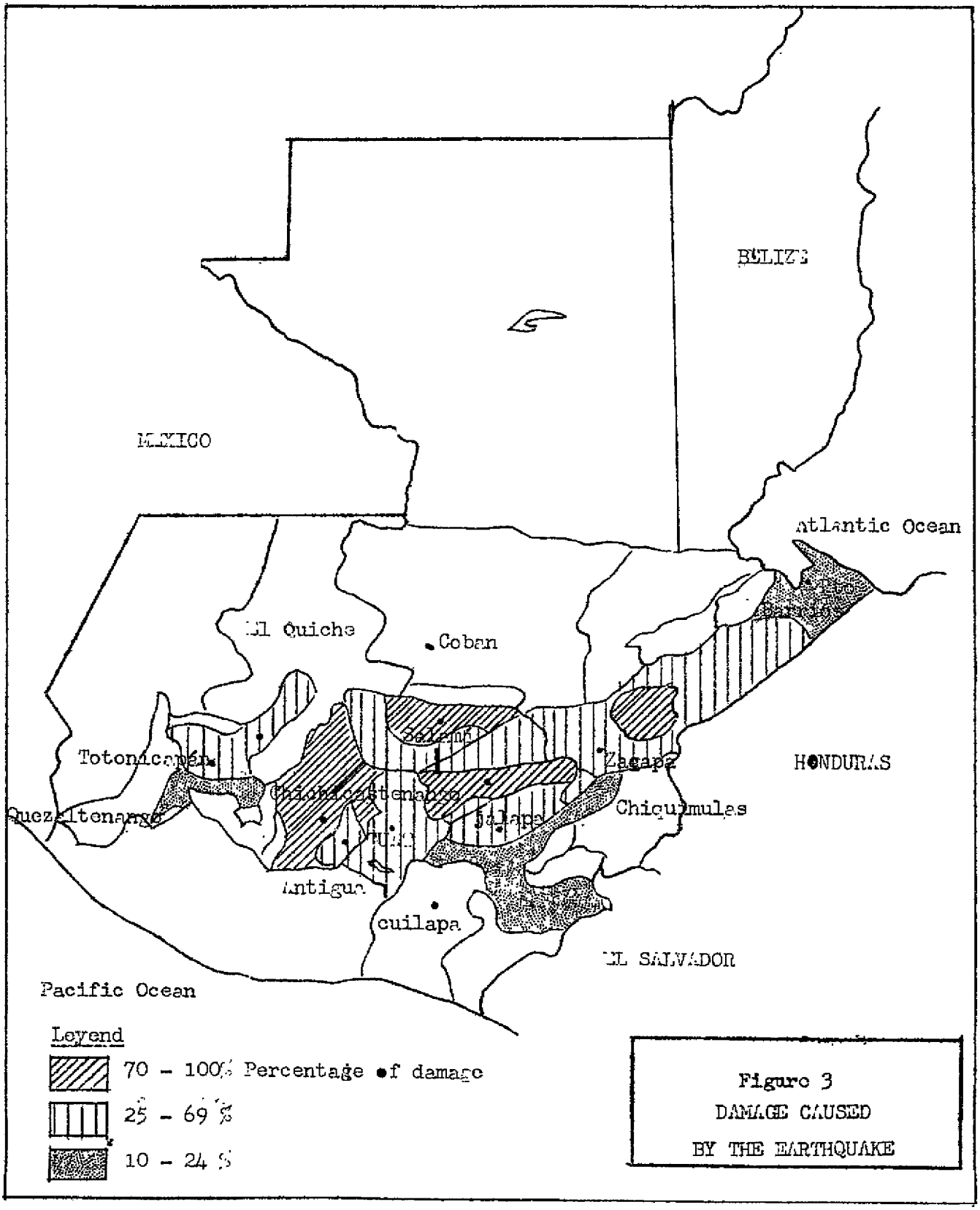

Figure 3
DAMAGE CAUSED
BY THE EARTHQUAKE

/Chamaltenango, San José Poaquil,

Chimaltenango, San José Poaquil, San Martín Jilotepeque, Comalapa, Santa Apolonia, Tecpán, Patzún, Patzicia, Santa Cruz Balanyá, Acatenango, Yepocapa, San Andrés-Itzapa, Parramos, Zaragoza and El Tejar in the departamento of Chimaltenango; Joyabaj in El Quiché; Salamá in Baja Verapaz, and Gualán, Cabañas and Huité in Zacapa. Great damage also occurred in the Capital of the Republic, as is shown below.

The fact that the damage was so great and covered such a wide area may be explained in the first place, by the great size of the fault which caused the earthquake and, secondly, by the widespread use of unsuitable construction materials and procedures. The majority of the dwellings destroyed in the interior of the country were of adobe and tile, and did not have a structure which would make the construction rigid and safe, besides having cement work which was badly eroded by the elements.

2. Action taken by the Government and the international community

Immediately following the disaster, the Guatemalan Government took a series of measures to organize and co-ordinate the aid needed by the population, asses the magnitude of the damage and its impact on the economy and begin to plan the reconstruction of the devastated zone.

The National Emergency Committee was made responsible for immediate action, and - with the efficient help of the Guatemalan army - it mobilized all the available resources to rescue and attend to the wounded, and to see to the distribution of food, curative and preventive medical attention, the supply of clothing and temporary shelter and the restoration of the communications needed for the rescue operations.

/The Committee

The Committee was responsible for receiving, classifying and co-ordinating all the aid generously provided by the international community from the very first.5/ It also informed the population of the location of the aid centres so that they could make use of the emergency services available. It undertook a campaign of preventive health measures for the victims, and saw to the disposal of bodies, so as to avoid possible epidemics and a greater loss of life. Finally, it carried out a survey to attempt to determine as exactly as possible the number of dead and wounded, and to make a first assessment of the amount of damage suffered by the affected towns and villages.

At the same time, work began on the quantification of the damage, its impact on the economic and social development of the country and the formulation of plans for rehabilitation and reconstruction. The General-Secretary of the National Economic Planning Council - with the collaboration of various national and international bodies - on 25 February concluded the report describing the losses recorded and giving the outline of an immediate reconstruction programme.6/

It may therefore be said that immediately after the disaster the Guatemalan Government opportunely and efficiently took all the emergency measures which the situation called for, and without loss of time began to plan rehabilitation and reconstruction efforts. The international community - as in the case of the other disasters which have occurrred in Central America - again effectively contributed to the rescue and emergency work. It is to be hoped that this invaluable aid will be maintained in the necessary form for the reconstruction of the country.

5/ Since the disaster, Guatemala has received some 10,000 metric tons of supplies, medicines, clothing, tents and other goods, as well as 2 million dollars in cash. This aid came from many countries, particularly the United States of America, Mexico, Venezuela and Guatemala's Central American neighbours.

6/ See Evaluación de los daños causados por el terremoto, su impacto sobre el desarrollo económico y social, y lineamientos para un programa inmediato de reconstrucción, op. cit.

II. ESTIMATES OF THE DAMAGE

There appear below the results of the assessment of the damage caused by the earthquake based on the first estimates carried out by the General Secretariat of the National Economic Planning Council of Guatemala - after having analyzed the surveys carried out by the different bodies in each sector - and on ECLA estimates based on an on-the-spot inspection.

It should be pointed out that these estimates are only a first approximation to the quantification of the damage, since naturally the information available could not be exhaustive. The appraisals are in many cases based on the quantification of the number of units damaged for which it would be necessary to calculate the average replacement cost. In many cases the damage cannot be quantified, such as that suffered by historical monuments which are part of the cultural heritage of the country and are of inestimable value.

This assessment does not include any estimate of the loss of profits or production due to the paralization of or fall in economic activity - in view of the difficulty in quantifying them - mainly in relation to small business and artisanal industry, the transport of goods and tourist services.

Nor has it been possible to evaluate the damage to the ecology caused by rock falls, landslides, diversions and changes of the courses of rivers, loss of arable land and, in general, changes in the topography of the country.

1. Population

The total population of the departments most seriously affected by the earthquake is over 3.4 million persons (64 per cent of the total population of the country. It is estimated that three-quarters of these were in some way affected by the earthquake.

/The greatest

The greatest damage caused by the earthquake is, of course, the estimated 23,000 persons who lost their lives. Over 70,000 wounded, many seriously, are also reported. (See table 1.) The impact of the dead and wounded is inevitably great, particularly in the places where over 10 per cent of the population died.7/

Although detailed figures are not available, it is evident that the labour force of the country was severely affected by the earthquake. Many family nuclei have lost their main source of support and the number of orphans is high. Many of the wounded are wholly or partially incapacitated for work. It may therefore be said that the pressure on the country's social assistance system - already rather weak - will rise significantly.

2. Housing

Apart from the loss of life, the greatest damage caused by the earthquake was in the housing sector. The great housing shortage which already existed before the disaster has been compounded by the total or partial destruction of some 222,000 units. About a million inhabitants - one-sixth of the population - have thus been made roofless and shelterless. (See table 2.)

Preliminary calculations, based on the average cost of replacement of each type of dwelling, place the loss in this sector at 417.5 million dollars, to which a further 30 million dollars should be added for repairs to only partially damaged housing (5 per cent of the value of the dwellings not destroyed in the disaster zone). Twenty-one million dollars are added for the replacement of furniture and other household goods which could not be rescued. Thus total losses in this sector are estimated at 468 million dollars.

7/ In at least one locality - Santa Apolonia, Chimaltenango - 20 per cent of the population died and another 20 per cent were wounded.

/Table 1

Table 1

GUATEMALA: DAMAGE TO THE POPULATION AND ASSESSMENT OF MATERIAL DAMAGE

(Data to 23 February 1976)

	Total population a/	Dead	Wounded	Dead (%)	Material damage (%)
Dept. of Chimaltenango	194 735	13 792	32 377		
Chimaltenango (capital)	20 194	600	3 000	2.97	75
San José Poaquil	9 795	1 000	2 657	10.21	90
San Martín Jilotepeque	33 066	2 920	6 000	8.83	100
Zaragoza	7 317	366	1 000	4.10	100
Patzicia	10 585	811	2 248	7.66	90
Santa Cruz Balanyá	2 903	100	600	3.44	80
Tecpán	24 181	3 023	7 000	12.50	100
Patzún	18 900	309	1 003	1.63	85
Parramos	3 237	200	900	6.18	90
El Tejar	3 039	50	900	1.65	85
San Andrés Itzapa	8 447	150	728	1.78	90
Yepocapa	10 457	87	289	0.83	90
Comalapa	18 163	3 200	5 000	17.62	95
Santa Apolonia	4 182	900	844	21.52	85
Acatenango		38	208	-	90
Dept. of Guatemala	1 108 186	3 350	16 264		
Guatemala	700 504	1 195	5 550	0.17	45
San Pedro Sacatepéquez	10 714	720	1 667	6.72	100
San Juan Sacatepéquez	43 116	720	2 400	1.67	100
Chuarrancho	6 985	42	1 789	0.60	60
San Raymundo	9 225	118	1 543	1.28	60
San Pedro Ayampuc	10 481	54	316	0.52	90
Mixco	129 878	346	2 100	0.27	80
Amatitlán	26 412	16	350	0.06	20
Palencia	18 932	68	157	0.36	60
Villa Canales	32 774	5	167	0.01	20
San Miguel Petapa	8 078	2	140	0.02	70
Santa Catarina Pinula	12 934	9	70	0.07	75
Chinautla	32 763	50	15	0.14	80
Villa Nueva	-	5	167	-	18
Dept. of El Progreso	73 122	2 001	7 662		
El Progreso	11 048	1 300	3 500	11.76	96
El Jícaro	6 197	372	2 538	6.00	100
San Agustín Acasaguastlán	17 344	126	917	0.73	50
Morazán	7 080	134	570	1.89	100
Sanarate	15 253	69	137	0.45	70

/Table 1 (continued)

Table 1 (continued)

	Total population a/	Dead	Wounded	Dead (%)	Material damage (%)
Dept. of Sacatepéquez	99 988	1 692	9 045		
Antigua	26 945	277	1 251	1.03	25
Sumpango	10 232	315	1 303	3.08	100
Magdalena Milpas Altas	2 921	135	584	4.62	50
Jocotenango	3 426	118	582	3.44	30
San Lucas Zacatepéquez	4 344	157	1 170	3.61	40
San Antonio Aguas Calientes	3 866	113	544	2.92	50
Pastores	4 592	127	567	2.77	30
Santo Domingo Xenacoj	2 759	57	560	2.07	70
San Miguel Dueñas	4 215	7	524	0.17	30
Santiago Sacatepéquez	7 943	329	1 447	4.14	40
Santa María de Jesús	7 144	2	218	0.10	20
San Bartolomé Milpas Altas	1 513	55	295	3.64	40
Dept. of Quiché	298 686	831	5 672		
Santa Cruz del Quiché (capital)	35 147	56	175	0.16	30
Joyabaj	32 134	600	5 497	1.87	95
Chinique	4 353	35		0.80	
Chichicastenango	45 733	140		0.31	
Dept. of Jutiapa	233 232	13	48		
Jutiapa (capital)	54 680		18		
Asunción Mita	29 071	13	30	0.04	
Dept. of Zacapa	105 739	693	1 998		
Zacapa (capital)	34 703	198	475	0.57	50
Gualán	23 375	187	550	0.80	99
Río Hondo	9 637	95	281	0.99	80
Cabañas	5 817	89	240	1.53	95
Huité	3 941	67	152	1.70	75
Usumatlán	3 771	26	150	0.69	50
Teculután	5 933	31	150	0.52	60
Dept. of Sololá	127 268	110	300		
Sololá (capital)	25 819	110	300	0.43	
Dept. of Baja Verapaz	106 957	152	718		
Salamá	21 913	119	377	0.54	75
Rabinal	20 393	33	341	0.15	90
Dept. of Izabal	169 818	73	379		
Puerto Barrios	38 903	30	167	0.08	50
Los Amates	45 537	14	158	0.03	2
Morales	52 677	29	54	0.03	-

/Table 1 (conclusion)

Table 1 (conclusion)

	Total population a/	Dead	Wounded	Dead (%)	Material damage (%)
Dept. of Totonicapán	166 809	27	89		
Totonicapán (capital)	52 688		10		50
Santa María de Chiquimula	15 161	3	10	0.02	-
Momostenango	43 398	3	11	0.01	-
San Cristóbal Totonicapán	16 623		3		-
San Francisco El Alto	19 329	21	55	0.11	50
Dept. of Chiquimula	158 177	50	378		
Chiquimula (capital)	38 872	10	110	0.03	-
Esquipulas	19 304	20	110	0.10	1
San Jacinto	5 851	20	158	0.34	-
Dept. of Jalapa	118 074	91	473		
Jalapa (capital)	45 425	27	254	0.06	50
San Pedro Pinula	23 846	9	97	0.04	25
Mataquescuintla	16 145	55	122	0.34	20
Other departments (Quezaltenango, Huehuetenango, Alta Verapaz and Santa Rosa)	1 139 037	82	1 522		
Total		22 778	76 504		

Source: Comité Nacional de Emergencias de Guatemala.

a/ 1973 Census figures. The totals do not agree with the summ of the partial figures because the municipalities which were not damaged are not included.

/Table 2

Table 2

GUATEMALA: ESTIMATED LOSSES IN THE HOUSING SECTOR

	Number	Estimated unit cost (dollars)	Replacement value (millions of dollars)
Total			468.2
Dwellings destroyed	222 261		417.3
Metropolitan area	58 760	4 000	235.0
Departamental capitals	11 237	3 000	33.7
Municipal head towns	38 358	1 500	57.5
Villages, hamlets, etc.	113 906	800	91.1
Dwellings damaged			30.0 a/
Durable goods destroyed			20.9 b/

Source: Secretaría General del Consejo Nacional de Planificación Económica and ECLA estimates.

a/ The cost of repairs was estimated at 5 per cent of the value of the dwellings not destroyed.

b/ The cost of replacement was estimated at 5 per cent of the value of the dwellings destroyed.

3. Infrastructure of basic services

The social infrastructure, of basic services for the population, was also severely damaged, with the destruction or damaging of hospitals and health centres, water supply and sewage services and systems, schools and other educational centres, etc. Losses in this sector have provisionally been estimated at 147 million dollars; 86 million in the public sector and 61 million in the private sector.

(a) Education

With regard to the educational infrastructure, the number of students at all levels who have been affected is estimated at a quarter of a million, with 1,215 buildings destroyed or seriously damaged and unuseable, which represent 25 per cent of the total of classrooms available before the earthquake. The situation is still more serious if it is borne in mind that before the disaster only 40 per cent of the school-age population could receive attention. The damage in this subsector is provisionally estimated at 43 million dollars, 37 million in the public sector and 6 million in the private sector.

The distribution of the losses by pre-primary, primary and secondary education centres is shown in table 3.

(b) Health and social welfare

Installed capacity for the provision of preventive and curative health services was reduced by the complete destruction of 5 hospitals, 3 health centres and 2 health posts, and as a result of considerable damage to 6 hospitals, 8 health centres and 53 health posts. Seventy-two social welfare centres, including homes, orphanages and other centres were also more or less seriously damaged. The total cost of replacement of the buildings destroyed and repairs to those damaged is estimated to reach 53 million dollars. Among the hospitals which were totally destroyed was the biggest hospital in the country - the Hospital General San Juan de Dios, with over 1,500 beds -, the Military Hospital and the Maternity and Children's Hospital of the Guatemalan Social Security Institute. The majority of these centres are continuing to operate - at least partially - in temporary installations.

/Table 3

Table 3

GUATEMALA: DAMAGE TO THE SERVICES INFRAESTRUCTURE

	Buildings affected (number)	Replacement value (millions of dollars)		
		Total	Public	Private
Total		147.3	130.3	17.0
Education	1 215	42.7	36.7	6.0
Preprimary	52	0.8	0.4	0.4
Primary	1 108	19.3	17.4	0.9
Secondary	55	21.2	18.1	3.1
Universities	-	1.4	0.8	0.6
Health		54.1	49.2	4.9
Hospitals	11	39.0	39.0	-
Health centres	11	2.0	2.0	-
Health posts	55	1.1	1.1	-
Others	5	5.7	5.7	-
Social welfare centres	72	6.3	1.4	4.9
Aqueducts and drains		11.9	11.9	-
Capital city		3.4	3.4	-
Interior of the country	75	8.5	8.5	-
Public buildings		27.0	27.0	-
Central Government and autonomous	150	12.0	12.0	-
Municipal Governments	...	15.0	15.0	-
Churches, monuments, archeological sites		9.6	3.5	6.1
Damage to urban paving		2.0	2.0	-

Source: Secretaría del Consejo Nacional de Planificación Económica.

/(c) Aqueducts

(c) Aqueducts and drains

The drinking water supply and sewage systems of a total of 75 municipalities were considerably damaged, and the cost of repairing them is provisionally estimated at 12 million dollars. The damage consists of the partial destruction of installations to collect, purify, pipe and distribute the water in the capital and the cities of the interior, and partial damage or disability caused to systems to treat and dispose of used water in the capital, and other drainage systems in the interior.

(d) Public buildings

About 150 buildings belonging to public sector institutions were severely damaged, although only some 25 will have to be demolished and completely re-built. The cost of repairing and rebuilding these installations is estimated at 12 million dollars. It has not been possible to quantify with any precision the damage to and destruction of municipal government buildings; it is nevertheless estimated that the cost of replacement will not be below 15 million dollars.

(e) Churches, monuments and archeological sites

The cultural heritage of the country suffered incalculable damage with the destruction of or damage to many churches, monuments and archeological sites, including Iximché and Mixco Viejo. A very preliminary estimate of the cost of repairing some of these centres, where rehabilitation is possible, would be about 10 million dollars, 4 of which would be for archeological sites and monuments and 6 for churches.

(f) Urban paving

Finally, the damage caused to the street paving in the capital and other large towns is estimated at 2 million dollars.

4. Support infrastructure for production

If the damage to the social sector infrastructure is considerable, and calls for very urgent action to re-establish it, the damage to the infrastructure supporting production was also significant. It is estimated provisionally at some 75 million dollars, mainly for roads and bridges (63.1 per cent), ports (22.3 per cent), telecommunications and post office (8.2 per cent), agricultural infrastructure (3.3 per cent), rail transport and generation of electricity. (See table 4.)

/Table 4

Table

GUATEMALA: VALUE OF DAMAGE TO THE PHYSICAL INFRASTRUCTURE

	Debris (thousands m3)	Lenght to be rebuilt (kms)	Other damage	Replacement cost (millions of dollars)
Total	2 047	460		74.5
Highway transport	1 847	400		47.0
Highway CA-1, Guatemala-Quezaltenango	217	97		12.3
Highway CA-9, Guatemala-El Rancho	408	78	3 bridges destroyed	11.7
Highway CA-9, Guatemala-Escuintla	80			0.2
National highway Nº 1	590	30		5.3
National highway Nº 10	372	15		8.0
National highway Nº 15	180	-		0.5
Secondary roads	...	180		9.0
Rail transport	200	60		1.2
Ports				16.6
Puerto Barrios	-	-	Pier destroyed	16.0
Santo Tomás de Castilla	-	-	Slight sinking	0.2
La Aurora Airport	-	-	Damage to the terminal	0.4
Electricity generation and transmission lines		-		1.1
Communications				6.1
Telephones				4.8
Telegraph and postal services				0.6
Other communications media				0.7
Agricultural infrastructure			Damage to irrigation systems, silos, etc.	2.5

Source: Secretaría General del Consejo Nacional de Planificación Económica.

/The destruction

The destruction which occurred directly jeopardizes the productive activities which were not affected by the earthquake, raises the cost of transport to a vital region for the exportation of agricultural products, and raises a serious obstacle to rehabilitation and reconstruction work.

The most serious damage was certainly that done to the highway linking Guatemala City and the main centres of production of the country with the Atlantic ports. This highway will be out of use for a number of months, although it has been possible to restore railway communications. Fortunately there are alternative roads, but the cost of transport by them is much higher.

(a) Road transport

The cost of the damage to the highway infrastructure is provisionally estimated at 47 million dollars, stemming from the reconstruction of 220 kilometres of paved highway and 180 kilometres of secondary roads, the moving of 1.8 million cubic metres of debris and the rebuilding of three bridges. (See again table 4.)

The eastern region has lost its direct link with the capital, so that traffic from the Atlantic is forced to use an alternative route through El Salvador, with a consequent rise in the cost of transportation, which is transmitted to the users. In the Altiplano a number of highways have been broken, causing difficulties for rescue efforts.

(b) Railway transport

Damage in this area is restricted to the breakage and destruction of various lengths of track between the capital and the Atlantic. Many rock falls and landslides have affected a total of 60 kilometres of this line, especially between Sanarate and the capital. 1.2 million dollars are tentatively required to repair this damage.

Teams from FEGUA - the Guatemalan railway company - are working to restore railway traffic provisionally, at least temporarily. Traffic has been partially re-established, but a longer period will be needed for final repairs.

/(c) Ports

(c) Ports and airports

The damage in this area is estimated to reach 16.6 million dollars. At Puerto Barrios the pier collapsed after breaking in a number of places and is considered irreparable. A warehouse was damaged and special loading equipment and some wagons were lost. The cost of replacing the pier and the equipment is calculated to be 16 million dollars.

In the port of Santo Tomás de Castilla, a slight subsidence caused minor damage which will cost 200,000 dollars to repair. It is thought feasible that, with operating improvements, Santo Tomás will be in a position to absorb the operations which were carried on in the neighbouring Puerto Barrios.

The international airport in the capital suffered some slight damage, to the building adjoining the Dirección de Aeronáutica Civil and the flight control tower. The runway was not damaged in any way and the airport has therefore continued to function at normal levels. The damage to the airport buildings is estimated at 400,000 dollars.

(d) Electricity generation

The electricity generation, transmission and distribution systems of the affected region were slightly damaged. Repairs are estimated at 1.1 million dollars.

The Empresa Eléctrica de Chimaltenango suffered damage, which has not yet been repaired, to two hydroelectric plants with a capacity of 1,100 kW. The damage to the two sub-stations of the Instituto Nacional de Electrificación (INDE) and the Empresa Eléctrica de Guatemala, located in the outskirts of the capital, and the substation of INDE in Zacapa have already been repaired. The distribution networks of these three companies were also considerably damaged.

(e) Telecommunications

This subsector suffered damage estimated at 6 million dollars, without including damage to the buildings of the public companies concerned. The telephone system, operated by GUATEL, suffered 4.8 million dollars damage, but the service is already operating with relatively high efficiency thanks to the emergency repairs carried out. Damage to the telegraph and postal systems of the interior amounted to 600,000 dollars, and here again services have been restored.

/The mass

The mass communications media - radio, television and daily newspapers - suffered considerable losses which, for the time being, are placed at 700,000 dollars. The damage is still being repaired, and therefore only partial services are provided.

(f) Agricultural infrastructure

Provisional calculations indicate that the irrigation systems, grain storage installations and other agricultural infrastructure suffered losses of about 2.5 million dollars. In any case, they are mainly private sector works and systems located in the eastern region of the country.

5. The productive sectors

The provisional information which it has been possible to obtain on the situation in the productive sectors suggests that the main damage occurred in small-scale artisanal and industrial activity. The destruction of important means of communication (which will make supplies more difficult) and the lower level of labour activity, stemming from the tragedy produced in families by the catastrophe, will also have a significant effect on the production and distribution of specific goods during the next few months. Total losses in these sectors are estimated at 58 million dollars. (See table 5.)

(a) Agricultural sector

In this sector the main losses were in some harvests of basic grains - mainly maize, beans, rice and wheat - which could not be fully collected in good time, and in damage to poultry farming installations and losses of laying and fattening birds. Total damage is provisionally estimated at some 8 million dollars.

The agricultural products for export are generally cultivated outside the area mainly affected by the earthquake, and were therefore virtually undamaged. However, their transport costs will be raised by the need to resort to alternative longer roads to the Atlantic port.

There may also be some shortage of manpower during the period of collection of some of these harvests.

/Table 5

Table 5

GUATEMALA: ESTIMATED LOSSES IN THE PRODUCTIVE SECTORS

	Description of the damage	Losses (millions of dollars)
Total		58.0
Agriculture		8.0
Basic grains	Uncollected harvests of wheat, maize, beans and rice	5.4
Poultry farming (laying)	Installations, machinery, loss of birds	2.3
Poultry farming (fattening)	Installations	0.3
Industry		25.0
Large industry	150 establishments damaged; loss of stocks	12.0
Medium industry	Installations, loss of stocks	8.0
Artisanal industry a/	Installations, equipment and finished products	5.0
Trade		10.0
Services		15.0
Mining		-

Source: Secretaría General del Consejo Nacional de Planificación Económica and ECLA estimates.

a/ In addition, the net income the artisans fail to earn is estimated at 1.7 millions dollars and the value of the production which does not take place amounts to 4.4 million.

/(b) Industrial

(b) Industrial sector

The industrial sector was more damaged than agriculture. Almost 50 per cent of manufacturing establishments were damaged - although not significantly, in the great majority of cases - and the total is estimated at some 12 million dollars. These losses are for damage to buildings and loss of stocks of raw materials and finished goods.

On the other hand, the small and medium-scale industries located in the affected areas suffered considerable damage; although their share of the total product of the sector is very small, they are of great importance at the level of the family economies of thousands of small businessmen. The losses are calculated at 8 million dollars.

In the same way, artisanal activity was severely affected, with damage to workshops which employed some 50,000 artisans, who have lost their main source of income. This activity is also closely linked to tourism. Losses under this heading are provisionally estimated at no less than 5 million dollars.

(c) Trade sector

The businesses most directly and seriously affected by the earthquakes were the small and medium-scale businesses located in the most severely damaged areas of the capital and the cities of the interior. Large-scale trade suffered very limited damage, estimated at 10 million dollars for damage to or destruction of buildings and loss of stocks.

(d) Services sector

This heading includes the services of hotels and the condominiums used for private offices. Damage to them amounts to some 15 million dollars. Of the total of 1,228 hotel rooms, some 40 per cent were put out of use and it is estimated that 2 or 3 months will be needed to repair the majority of them. In any case, at least two hotels (second class) will have to be demolished.

The financial sector has also been adversely affected by the disaster, although there is no loss for the economy as a whole. It is to be expected, for example, that there will be large withdrawals

/from savings

from savings accounts during the next few months, with an equal drop in the availability of resources of the financial intermediaries. The reserves of insurance companies will fall by no less than 3 million dollars because of the payments of insurance claims.8/

(e) Mining sector

Mining and oil exploration activities are being carried out in regions far from the zone affected by the earthquakes, and therefore suffered no damage.

6. Recapitulation

To summarize, the most important effects of the earthquake consisted more in damage of a social nature than in damage to the physical infrastructure or to production. To the total figure of loss of life (23,000 dead), and of wounded and distressed persons must mainly be added the considerable damage to housing and the social infrastructure of basic services.

Total damage, estimated at replacement cost, is provisionally reckoned at 748 million dollars, 543 million (73 per cent) of which in the private sector and 204 million (27 per cent) in the public sector. Of the total figure, 468 million (62.6 per cent) relate to damage in the housing sector; 147 million (19.6 per cent) to damage to the infrastructure of basic services; 74.5 million (10 per cent) to the infrastructure supporting production, and 58 million (7.8 per cent) to losses in the productive sectors. (See table 6.)

8/ It is estimated, on the basis of claims submitted until 28 February, as they will approach 30 million dollars. 88.5 per cent of this amount is reinsured abroad.

/Table 6

Table 6

GUATEMALA: TOTAL QUANTIFICATION OF THE DAMAGE CAUSED BY THE EARTHQUAKE

	Replacement cost (millions of dollars)		
	Total	Public	Private
Total	748.0	204.1	543.9
Housing sector	468.2	-	468.2
Housing destroyed	417.3	-	417.3
Repairs to damaged housing	30.0	-	30.0
Durable goods for housing	20.9	-	20.9
Social infrastructure of services	147.3	130.3	17.0
Buildings for education	42.7	36.7	6.0
Health and social welfare buildings	54.1	49.2	4.9
Aqueducts and drains	11.9	11.9	-
Public buildings	27.0	27.0	-
Churches, monuments, archeological sites	9.6	3.5	6.1
Damage to urban paving	2.0	2.0	-
Infrastructure supporting production	74.5	71.8	2.7
Highway transport and bridges	47.0	47.0	-
Rail transport	1.2	1.2	-
Ports and airport	16.6	16.6	-
Telecommunications	6.1	5.4	0.7
Electricity generation	1.1	1.1	-
Agricultural infrastructure	2.5	0.5	2.0
Productive sectors	58.0	2.0	56.0
Agriculture	8.0	2.0	6.0
Industry	25.0	-	25.0
Commerce	10.0	-	10.0
Services	15.0	-	15.0

/In addition,

In addition, it should be pointed out that the process of rehabilitation and reconstruction does not merely involve replacement of the losses in the same conditions as existed before the earthquake, but that this opportunity should be taken to improve the housing situation of the population affected by the earthquake and to rebuild the devastated towns with a concept of integral urban development. In this sense, the material losses estimated at some 750 million dollars would call for investment for reconstruction which would certainly exceed 900 million dollars. The size of this figure can be better understood if it is taken into account that a hypothesis of reconstruction over three years requires a construction effort which represents more than five times the annual effort in the country during the last decade in normal conditions.