to planning rather than a real attempt to make a transitional plan such as that proposed by the "100 Days Plan Group."

Due to severe criticism from the communities that expected pragmatic planning and solutions, the relationship between the NEC and GSNCEP was caustic, sporadic and superficial, and this relationship deteriorated more and more between the NRC and GSNCEP, because the NRC wanted pragmatic approaches and it felt that the GSNCEP never produced them. The GSNCEP did not have the technical capacity to answer the requests and needs of the NRC.

The third group of institutions was more technically-operationally oriented. The members of this group were in the field cooperating hand to hand with the people and concentrating their efforts on the actual rehabilitation of services. This group was formed by members of the National Institute of Geography, the National Institute of Forestry, the Public Works Offices, the Highway Department, the Indigenous Institute, the Institute of Municipal Promotion and scores of other minor institutions.

Coordination among representatives of these groups was accomplished at the operational level on a regional and local basis by NEC. The President of Guatemala and the Coordinator of the NEC were informed personally by these Guatemalan field specialists about the damages, resources, needs and solutions taken. A comprehensive picture of the earthquake based on field observation was given to decision makers by this group of agencies and therefore decisions concerning solutions could be made more rationally and the activities better organized.

Some of the technicians and scientists of this last group were concerned about some of the programs proposed by other institutions such as The Red Cross, CARE, the Army, Nueva Vida, some parishes of the Catholic Church, some persons associated with the Federations of Protestant Churches, CEMEC, CIDA-Canada, and a few others who were cooperating heavily with the NEC. This group felt these agencies were promoting paternalism, cultural disruption and dependence by giving free goods and services to some of the communities affected. This concern was immediately transmitted to the President, the Ministry of Defense and especially to the Coordinator of NEC, who decided on a policy discouraging give-away programs, explaining to these agencies the problems that these actions were creating in communities for the Guatemalan government.

As has been stated, these three "committees" comprised of groups of institutions transmitted different concepts, ideas and goals for reconstruction to decision makers.

The Damage Assessment Period

Reconnaissance activities leading to damage assessment were conducted by the NEC immediately after the earthquake. This reconnaissance was concerned mainly with assessing the loss of human lives, care of the injured, and with infrastructural losses. The figures obtained were preliminary and were used to assess the scale and magnitude of the damages.

A more precise inventory was undertaken by the GSNCEP on February 15, 1976. This institution used data obtained from NEC as a basis for determining human losses and concentrated most of its efforts on economic

and physical damages to the infrastructure. The GSNCEP document presented to the President of Guatemala became the preliminary official evaluation of the Guatemalan government at the end of March, 1976 (SGCNPE 1976). The following inventory of the damages was taken from that document (Table 3-1). This evaluation underestimated the damages derived from the 1976 earthquake for the reasons given above and in 1978 the NRC gave the final figure at about 2.0 billion U. S. dollars.

There were many problems involved in making an accurate assessment of damages. The NEC started its reconnaissance evaluation the day of the earthquake and used a team of army officers and the logistics of the Ministry of National Defense to speed the acquisition of data. By February 12, 1976 this reconnaissance had produced enough data for a qualitative estimation of the damages but this estimate furnished only an overall picture of the situation and the magnitude of the damages.

The preliminary inventory done later by the GSNCEP encountered no major operational problems but conceptually it was more interested in quantifying economic damages than in assessing potential social problems. This inventory produced good data on infrastructure losses but underestimated the reconstruction and rehabilitation costs. In certain exceptional cases some of the damaged areas were not surveyed, but under the circumstances the inventory was excellent and produced an operational and gross economic scheme for the establishment of reconstruction policies.

Scientific and academic study and inventory of the earthquake as a natural phenomenon was initiated by a request of the Guatemalan

TABLE 3-1

Damage Estimates Provided the Guatemalan Government by GSNCEP, March 1976

Sector	Units Lost or Damaged	Estimated Costs (U.S.$ Millions)	% of the Damaged in the Affected Area
Housing Urban/Rural	117,117/141,362	600.4	41/44
Household Furnishings	-	55.8	-
Hospitals/No. of Beds	15/4775	52.6	61
Health Centers/Posts	28/55	4.6	80
Schools/No. of Students Affected	1214/243,640	50.6	59/-
Welfare and Community Centers	62	10.6	44
Municipal Potable Water & Sewage Systems	242 Rural - 74 Urban	9.8	> 60 < 80*
Public Buildings	133	15.0	> 40 < 60*
Agricultural Losses (grains)	436,500 quintales (1 Quintal=100 pounds)	5.4	Approx. 5(corn) 10(other)
Highways & Roads	400 kilometers	48.4	> 20 < 30*
Railroads	60 kilometers	1.3	20
Seaport & Infrastructure	2	19.7	-
Guatemala City Airport	1	0.4	> 5 < 10*
Electric Plants	5	1.2	-
Communication Systems	Hundreds	6.8	-
Agricultural Infrastructure	Mainly Irrigation Channels	2.8	-
Poultry Systems	Dozens	3.3	-
Industrial Installations	713 (light damage)	18.9	57
Handcraft Industries	49,980 workers	4.1(equipment losses)	-
Small Businesses	Hundreds	5.7	-
Hotel Bedrooms and Offices	489	16.9	40
Archaeological,Colonial and Other Cultural Patrimony	Hundreds	31.4	Approx.80
Urban Services - Streets, Pavement and Other	Hundreds	26.3	> 40 < 60*
Municipal Services & Other Properties	Hundreds	19.0	> 30 < 50*
TOTAL		1,021.0	

*Estimated by L. Ferraté

government to the Organization of American States. This request was generated by geologists from the National Institute of Geography who also contacted some American universities and the U. S. Geological Survey requesting assistance. The U. S. Geological Survey sent several scientists to investigate the origin and consequences of different events and hazards derived from the earthquake. The preliminary findings may be found in the U.S.G.S. Professional Paper 1002 and also in the Proceedings of the International Symposium on February 4, 1976 Guatemanan Earthquake and the Reconstruction Process carried out in Guatemala City in 1978.

Data from these reports established the time of the earthquake at 03 02 43.3 A.M. and located the hypocenter at Los Amates - Latitude $15^{o}32'$ North, Longitude $89^{o}08'$W at a depth of 5 kms. at the point of initial rupture(Person 1976:17). The length of the fault break was established to be close to 250 kilometers in length and the magnitude of the earthquake was 7.5 (Urrutia 1976). According to this report the quake was felt over an area of 100,000 square kilometers and was produced by a left-lateral slippage of the Motagua fault. It severely affected about 33,000 square kilometers and was characterized by average Modified Mercalli intensities of over VI, with 1700 areas having intensities of approximately IX (Espinoza 1976:51).

Horizontal displacement along the fault averaged 1.1 meters with a maximum of 3.4 meters (Bucknam 1978). The earthquake produced about 10,000 minor landslides, most of them of less than 15,000 cubic meters and 90 percent of them associated with pumice Pleistocene deposits (Harp 1978). These were the most important visible characteristics of

the earthquake and produced concern for the safety of the population near them. A number of aftershocks also produced great concern for the safety of the people, especially the ones before February 7, 1976, that reached magnitudes of 5.8 in the area of Guatemala City (INSIVUMEH 1976). Especially violent was the aftershock of February 7, 1976 that fractured walls, collapsed damaged house structures and disrupted basic services such as potable water and drainage systems.

The main problem regarding the scientific inventory of the earthquake was the coordination of scientific and pseudo-scientific teams. A coordinator for scientific activities was named by the NEC in order to organize a joint effort and approach to the problem and to share resources such as helicopters, vehicles, gasoline, local capabilities and knowledge. The coordination effort partially succeeded but mainly due to the interest of local scientists from different Guatemalan institutions such as the Center of Higher Military Studies, "Centro de Estudios Militaries," The National Institute of Geography, The University of San Carlos (USAC), The Guatemalan Chamber of Construction, The Institute of Seismology, Volcanology, Meteorology and Hydrology (INSIVUMEH), The National Institute for Electricity (INDE), ICAITI and others who made a personal effort to help share and facilitate the work of the international scientific community and obtained valuable field data. These scientific inventories complemented the information of the NEC and supported the evidence that the earthquake caused great damage, especially among the poor in rural and urban communities.

Most adobe structures collapsed and since adobe was the primary housing material in use, housing reconstruction was the main need as

well as the rehabilitation of the social infrastructure consisting of facilities for medical and educational services, sanitation, water, sewage, and community development. Sports and other services were also either destroyed or severely affected.

Wealthy neighborhoods were only slightly damaged because their service infrastructure was more resistant to natural risks and hazards. The productive sector, especially large industrial and commercial systems, were virtually untouched because they represented an extension of the wealthy communities' landscape and therefore the physical infrastructure was also resistant to environmental risks and hazards.

The 1976 earthquake primarily affected the poor. This group consisted mainly of Cackchiquel Indians, rural and urban peasants, the emerging middle class of clerical workers, blue collar workers and some professionals. It had very light effects on a few rich people. This meant the poverty stricken rural communities and urban neighborhoods bore most of the losses. It was believed that if the Guatemalan government did not take the correct measures, the gap in economic wealth and services could be increased and, as a result, multiply the potential for social problems that might later be expressed in violence, social and cultural disruption and deterioration of human quality of life. The Guatemalan government decided to invest most of its resources in the communities affected in order to obtain two products, one the reconstruction of the country and the other, to minimize potential social unrest and violence. Everyone was aware of what had happened in Managua a few years before and people were anxious not to make the same mistakes.

Search and Rescue Activities

Early search and rescue activities were carried out by the people themselves. Guatemalans immediately reacted in a very positive and stoic fashion. Families began looking for missing members and bringing them to safe places and to medical service centers, such as hospitals of the Guatemalan Institute for Social Security (GTSS), government and private hospitals and clinics that were not affected by the earthquake and to the emergency Red Cross centers. Families and communities recovered casualties and covered them with sheets and waited for the authorities to come and decide what to do. Very few firemen, police, army soldiers and government service workers reported for duty immediately because their families had also suffered the impact of the quake. Only those on duty responded right away. By 7:30 A.M., however, some of the emergency corps were in full action, especially firemen, The Red Cross and GTSS. The lack of electricity and telephones in some areas did not permit an effective communication system and the NEC hurried to organize different groups for search and rescue activities in Guatemala City and the peripheral rural area and to establish emergency telephone and messenger service.

Throughout the affected region in areas where the rubble was dispersed or could be moved, most of the dead and injured were recovered by their families, but they needed help from rescue crews and community assistance where the rubble was concentrated. By noon, the first large crews and groups, mainly comprised of police and soldiers, were organized by the NEC in Guatemalan City to help the people in search and rescue activities.

A feeling of anguish and resignation toward nature was in the minds of most Guatemalans and a sense of brotherhood and a desire to help each other arose. People from different economic and social strata worked together and by the second day the people had rescued most of the bodies and cared for injured persons. Final rescue efforts became difficult, however, since rubble piled up in certain areas and removal was done mainly with hand tools. The feeling of brotherhood that arose resulted in an intercultural sharing process. Communities developed their own law and order systems and,as a consequence, no looting was reported. Few incidents of "acaparamiento" (speculation in foods and other goods) were registered. When this did occur it was mainly among wealthy people who were afraid that food could become scarce.

In some rural areas, particularly in the most devastated ones, the earthquake also produced an emotional shock during the first hours. The cities and towns of El Progreso, Sanaráte, Aguas Calientes, Charrancho, San Pedro and San Juan Sacatepéquez, Chimaltenango, Comalapa, San Martín Jilotepeque and Santiago Sacatepéquez - just to mention a few - were completely destroyed and their people were in a state of shock. Most of their leaders and officials were buried under the rubble or did not have the initiative to cope emotionally with the disaster. In these places, very few search and rescue activities were performed, perhaps due to the continuous aftershocks and the fragility of adobe structures that could fall down with a minor movement. In these places, very few families or organized community groups were looking for their members. Instead, they were expecting outside help, or orders from higher authorities.

These reactions persisted for a few hours, but little by little the shock began to dim and communities and families organized themselves for search and rescue activities within their towns. The NEC concentrated its efforts on organizing a network of local organizations in the rural areas, led by the governors of each department, the mayors of each municipio or village consisting of local firemen, police and other service workers. This network was supported by army logistics and manpower furnished by scores of university and high school students. By February 8, most of the departmental capitals, towns and large villages had completed most of their search and rescue activities. A problem remained in the most isolated villages and hamlets and army soldiers, firemen, university students and other foreign search and rescue groups started rescuing injured persons and burying the dead in those areas.

All in all, the search and rescue effort was very successful. Its greatest problem arose from difficulties derived from road blocks created by landslides, collapsed bridges and the consequent isolation of remote areas. During the search and rescue period one of the most effective groups assisting the NEC came from the Venezuelan Civil Defense System. They helped to coordinate these activities in the rural areas and sent experienced volunteers to help Guatemalan rescue teams.

Emergency Medical Care

Government medical services were severely damaged by the earthquake and very few hospitals and clinics were operating even at half capacity during the day immediately following the disaster. Fortunately, many private medical services as well as the Red Cross centers were only slightly damaged. During the first four days these services performed

an outstanding job and all available doctors were busy attending scores of injured people in both urban and rural areas. At the same time international medical assistance was landing at the Aurora airport. The NEC had immediately asked for international medical support and on the evening of February 4, the first field hospital arrived from Nicaragua. It was formed by a team of approximately 18 doctors and 24 nurses (de Ville de Goyet 1976) and set up at Chimaltenango. Mexico also sent an emergency hospital that the NEC located in Zone 6, Guatemala City; a Panamanian Emergency hospital was sent to El Progreso and a Costa Rican one supported by The Red Cross was established in Tecpán, Guatemala (de Ville de Goyet 1976). All these hospitals arrived on February 5th and all of them were operating at half capacity by the end of the day. By the next day (February 6th) they were operating at full capacity. The U. S. Army sent a field hospital of about 100 beds that the NEC decided to station at Los Aposentos, close to Chimaltenango. The U. S. also sent eight mobile medical brigades that attended persons in the most remote rural villages of the Departments of Chimaltenango, Guatemala and El Progreso. Four days after the earthquake, at least 16 hospitals and 92 emergency medical posts were in full operation (de Ville de Goyet 1976). In addition, from the first day, hundreds of private clinics gave free services. They operated at full capacity for about 15 days after the earthquake. After this, small field hospitals came from the U.S.A.

Most of the injured were treated in these facilities but many peasants and Indians did not accept the services offered because of misgivings and cultural beliefs and the mistrust they felt towards government services.

Together these medical services attended approximately 180,000 cases (Ferraté 1978) derived from the impact of the earthquake and its consequences. Of these, fortunately only 78,000 persons were classified as severely injured or wounded.

Temporary Shelter

In the preliminary evaluation of March 1976, the GSNCEP reported that about 1,213,294 persons were without shelter as a direct result of the earthquake. Some 258,479 houses were destroyed, 117,117 in the urban areas and 141,362 in the rural ones (SGCNPE 1976).

The most affected were the poor who lived in fragile adobe structures and in high risk areas characterized by high gradient slopes, potential flooded terraces, the edges of pumiceous plateaus and other fragile geomorphic features. There are no zoning regulations for human settlements, urban and rural in Guatemala and COGUANOR, The Guatemalan Commission for Regulations and Norms, did not have a land use zoning map for any urban center of Guatemala or an institutionalized Code for Construction of Infrastructure and Development of Human Settlements.

In Guatemala City, 126 large "asentamientos" (settlements or refugee camps) derived from the earthquake (Balcarcel 1978), arose mainly on vacant private or government land that was close to their destroyed "limonadas" (slums). Approximately 19,399 (Balcarcel 1978) families were counted in these settlements which spilled over into parks and streets. These families salvaged materials from their destroyed homes or shacks and built other ones with corrugated tin sheets, cardboard, canvas or cloth, or anything they could use for creating a shelter.

Most of the persons in these settlements were extremely poor, with no land or belongings and in extreme misery.

Besides these 126 large settlements, there were approximately 160 small temporary shelter camps located in streets and other public places. They were formed by families who were afraid of sleeping in their damaged houses. These shelters, mainly tents, disappeared about one month after February 4.

Many individual temporary shelters were also located on individual housing lots, owned or rented by their builders. These shelters (which were called "temblorerás") were bigger than the others and built with wooden beams and boards or plywood, with tin roofs. A few could still be seen in Guatemala City five years later because most of the so-called "temporary" shelters became permanent. The 126 large settlements consisted of temporary shelters made of a diversity of materials. Some used durable materials while others were extremely temporary. These ranged in size from very small to medium, averaging about 12 square meters. Most of these shelters had just one room and an attached "kitchen." Living conditions were hard but the community desire for development was incredibly high. There were few sanitary services such as latrines, water deposits and cisterns, and open ditches served for the drainage. Most of the services that were present were furnished by the CEN and other NGOs.

Although 126 settlements mushroomed all over the metropolitan area, certain clusters concentrated in Zones 3, 4, 5, 6 and 19 of Guatemala City. The NEC did not have the manpower and the logistic structure to deal

with them in any comprehensive fashion. The NEC concentrated on providing potable water and medical services, such as vaccinations and epidemiological control, and decisions about the destiny of all these settlements and other refugee camps were made by the National Reconstruction Committee which was formed later and had more legal, institutional and other supports to do so.

Outside the metropolitan area of Guatemala City in the department capitals, the problems were similar but of a lesser magnitude. Antigua Guatemala had three "settlements" with about 930 families; Jalapa, two "settlements" with approximately 160 families; Chimaltenango had four "settlements" with approximately 1000 families; Sta. Cruz del Quiché, three "settlements" with about 150 families; Zapaca, two "settlements" with some 280 families, El Progreso, three "settlements" with approximately 130 families. The other capitals had very small and dispersed "settlements."

Most of these families in temporary shelters outside Guatemala City had urban lots and, little by little, as the aftershocks diminished and basic services were restored, families returned to their housing sites and problems created by squatters settlements were reduced considerably. Only the settlements of Antigua Guatemala, Jalapa, Zacapa and Sta. Cruz del Quiché remained as an indication of severe lack of urban lots in these places. Later, in 1977 and 1978, urban community development projects were conducted by the NRC in those capitals to solve these problems.

The smaller the size of towns, villages and hamlets, the less concentrated the settlement pattern and the more dispersed the temporary

shelter camps, but two main trends of organizations were observed. People in the refugee "settlements" of the departmental capitals developed the same pattern of organization and used the same materials for their temporary shelters as in Guatemala City. This was an urban phenomenon. In rural towns, villages and hamlets, communities and families were more on their own after the earthquake. The shelters they built were more permanent. They used salvaged materials, along with agricultural left-overs such as cornstalks, cane, pajón, wheat, straw, wooden beams and boards and other materials. Sanitary conditions were also better than in the urban areas because these rural areas had very few services and social infrastructure to begin with and the impact of the earthquake was minimal. Most of the communities were used to this situation. This was especially true for the smaller villages where basic services are limited and scarce.

This was the situation during the first 10-15 days after the earthquake. Then a host of private voluntary organizations decided to provide shelter and other permanent aid to stricken communities. The earthquake had exposed the real quality of life of most Guatemalans and had shown it to be at or near the survival level for the majority. The earthquake laid bare the extreme economic misery and severe cultural disruption that was characteristic of life for hosts of Guatemalans.

Organizations like the International Red Cross, CARE, the Permanent Evangelical Committee, Food for the Hungry, World Neighbors - OXFAM, AID, Home and Development and other smaller ones decided to provide shelter to disaster victims. Approaches to this massive relief operation varied

tremendously. A group of organizations led by OXFAM-World Neighbors and partially supported by AID wanted to avoid what they defined as a paternalistic viewpoint of more traditional disaster relief methods. The approach of these organizations was to assist communities in using their local know-how, technical systems, and self reliance in order to strengthen grass roots organizations through the reconstruction process. Other institutions like The Red Cross and CARE, as well as other smaller NGOs, decided to use their usual charitable approaches and were not as much concerned about what the other group called paternalism as they were with the immediate delivery of assistance.

As an example, OXFAM-World Neighbors, AID, Home and Development and others established distribution-saturation programs of corrugated galvanized roofing, wood poles, nails and other construction materials. All were sold to disaster victims at subsidized prices and every individual had access to them. This program was highly regarded and supported by the NRC. In the case of AID, the funds derived from these materials became community seed capital for hundreds of community development programs. The NRC believed that this action strengthened local organizations and in some instances produced the starting point for "development committees" or Local Reconstruction Committees that were later the main structures for the work performed by the NRC and the NGOs.

The approaches of CARE, the Guatemalan Red Cross and other institutions were seen as "paternalistic" by the NRC, who believed that they created competitition among households in obtaining materials and sometimes led to discrimination because they could not help

everybody. The Committee felt that a feeling of "why you and not me" arose among many individuals and communities because of free housing assistance and this slowed down the reconstruction process. The NRC also believed that temporary structures furnished by some organizations would become more or less "permanent," but nevertheless would sooner or later have to be replaced. Even though the Committee felt this way, the Guatemalan Red Cross extended its temporary housing program for about a year after the emergency period was over.

The total number of temporary shelters built by the NGOs was close to 143,300 units and in spite of what the Committee regarded as paternalistic problems, these programs solved the emergency shelter problem and when the rains started, almost all of the affected families had a roof over their heads.

On the other hand, the NEC was presented with the "Shelter Operation Program" designed by several government and private organizations, led by the Guatemalan Chamber of Commerce and some members of the National Economic Planning Council. This program was initially going to give away materials for 40,000 shelters in Guatemala City and about 107,000 shelters in the other urban areas as well as rural areas (Rivera 1976). However, the Coordinator of the NEC believed that there were many potential problems with this plan, reduced it and decided a comprehensive housing reconstruction plan could be developed later by the emerging National Reconstruction Committee.

Emergency Food Supplies

The amount of food received by the NEC to distribute for emergency purposes was considered to be minimal, given the need perceived by the

Committee. Most of it consisted of powdered milk, grains, oil, soups, canned food and high protein flours or meals. Most was sent to the rural areas.

Emergency food distribution networks were managed mainly by CARE and Catholic Relief Services (CARITAS). About 9,788 tons of basic grains, mainly beans, corn and rice, and 8,465 tons of other foods such as powdered milk, wheat and corn flour, canned foods and oils, were distributed by these two organizations during the year following the earthquake. Approximately 1/3 of these supplies were used for emergency relief programs and the rest was channeled into their regular programs through schools, child care centers, churches, etc. (Bates, et al 1982).

Another emergency food network was developed by the Mexican Government, through CONASUPO, the National Company for Basic Necessities. This institution provided up to 300,000 hot meals a day in Guatemala City, beginning immediately after the earthquake. After 45 days its capacity was reduced to close to 100,000 meals a day (URF 1976). The Mexican food operation was located in Guatemala City close to Guatemalan Air Force headquarters. In the opinion of the National Emergency Committee it performed an outstanding and beneficial service, not only for needy disaster victims, but also for the workers engaged in relief and emergency activities. All the supplies were either brought from Mexico or bought in Guatemala. An estimated maximum of 3500 tons of food in the form of cooked meals was delivered through this program.

Other Central American countries, Mexico, Colombia, Venezuela, Brazil, as well as other countries from outside the region sent food

supplies but in small quantities. This source might account for another 500-1000 tons. However, no records are available since most of this food came by truck or plane and was delivered directly to the communities. European countries sent food supplies in the form of canned and preserved food but their use is not well established. Most remained in the city and did not reach the rural areas.

Finally, the German Government, through some local institutions, distributed some food relief in the Departments of El Progreso, Zacapa and Baja Verapaz. The approach used was similar to that employed by CARITAS but the programs were more selective and considered to be more successful by the National Emergency Committee. No information about the amount supplied is on record at the NRC.

In total, approximately 22,750 tons of food were distributed in emergency relief and in normal food programs. All of this food came from abroad but it did not represent a large amount compared to the need and according to the Committee it did not appear to severely disrupt food prices. These prices were coming down before the emergency but later increased due to inflation.

The earthquake produced small agricultural losses in the earthquake damaged zone. Some food was lost due to landslides, cracking soils, slumps and other mass earth movement and some due to damages derived from the rubble that covered individual and family food storage places. In addition, some food was lost due to delayed harvesting of late crops. The GSNCEP estimated that five percent of the expected corn crop was lost and about ten percent of the expected crops of beans, rice, sorghum and

wheat (SGCNPE 1976). The losses in pounds are as follows: corn (25,910,000); beans (6,780,000); rice (2,760,000); sorghum (5,220,000); wheat (2,980,000). The total amount represents 43,650,000 pounds (approximately 19,841 metric tons) (SGCNPE 1976). These figures indicate that the food input by the international organizations represented about 1.1 times the amount lost due to the earthquake and less than two percent of the available food in the country.

It is important to realize in evaluating food programs that food production, imports or prices don't represent a biological indicator of quality of life. Most of the poor communities in Guatemala do not have access to a good animal or vegetable food diet and their caloric ingestion was about 2166 or less calories per person per day (FAO 1979,Lunven and Periseé 1974). The deficit is mainly due to diminishing production of grain crops.Since 1975,Guatemala has imported grain through INDECA,the Institute for Agricultural Commercialization. For these reasons the National Reconstruction Committee considered the input of international food to be minimal. It satisfied the initial emergency food needs and for a few months improved the regular programs of CARE and CARITAS. Since much of it was used in connection with "food for work" programs that diminished the biological dependence of the communities, it served a development as well as a relief role.

NEC decisions concerning food distribution programs were mainly related to meeting urgent community needs and to supplying transportation and organizational support to speed such distribution programs. After supplying logistical support and assigning priorities, the responsibility for actual distribution was local. Private voluntary agencies, the

mayors of the towns and villages, local army posts and, in some instances, the pilots of the helicopters and airplanes of the Guatemalan Air Force had to take over the decisions and activities of distributing the food to the most isolated areas. In spite of the NEC efforts, in some instances, food distribution programs were badly organized and some communities obtained little help and others too much, but this was the exception and not the rule.

Restoration of Public Services

The NEC coordinated some of the efforts to restore basic public services but the actual work in the urban areas was done by municipalities and INFOM and by local authorities in the rural areas, with complementary Guatemanaln government support.

During the earthquake telephone service was only slightly affected in Guatemala City, Antigua Guatemala and Amatitlán, especially in the wealthy urban areas. Telephone and telegraph communications in inner cities were paralyzed and GUATEL, the telecommunications company, partially restored service in about four days in departmental capitals and in about 12 days in towns and some villages.

The electric systems went off during the earthquake when an automatic system cut off some of the circuits to avoid potential fires. Electricity was restored in most of Guatemala City within two days and in most of the departmental capitals within three days. The villages and towns with electric systems got their power back in about 10 days, with the exception of those that lost their generators (Chimaltenango, Gualán and Panaluyá).

Those responsible for the rehabilitation of power systems were the Guatemalan Electric Enterprise supported by the National Institute of Electrification. There is not a clear record of the amount of damage to the electrical systems of the country, but the main problems consisted of broken power lines and poles, short circuits, destruction of generators and some turbines, and manmade shutoffs derived from the fear of potential fires, and the danger of electrocuting people.

Telephone, telegraph and electric systems were relatively easy to repair. They used aerial networks (some were underground in Guatemala City) with recyclable materials. Expert restoring crews were available due to the frequent blackouts and telephone interruptions that normally occur periodically in Guatemala.

The restoration of public potable water systems was more difficult. Guatemala City did not have any gravity operated water supply systems for the first two days. Very few municipal wells were operating and only a few private wells were supplying water on February 5. The municipal plants of La Brigada, Acatán, Sta. Luisa, El Teocinte, El Cambray, Ojo de Agua, Las Ilusiones and Canalitos were damaged and the water lines broken. The first ones to be repaired were El Cambray and Ojo de Agua and within three days they were partially operating and supplying potable water to the western and southern parts of the city. As soon as the electricity was restored in all the areas, more municipal and private wells produced water and through government and private cistern trucks this water was delivered to the areas in need. The fifth day after the earthquake the center and eastern part of the city began to get water from Acatán and Teocinte plants. Some of this water was diverted into

the southeastern part of the city until Las Ilusiones' system was completely restored, but it took several months.

There were another 77 urban water systems severely affected outside Guatemala City, and another 246 town and village systems, that faced the same problem on a smaller scale. The damage to these systems was mainly in the main distribution lines and in chlorination plants.

The major disruptions occurred in the departmental capitals of El Progreso, Chimaltenango, Zacapa and Jalapa, and in the towns of San José Pinula, San José del Golfo, San Juan and San Pedro Sacatepequez, San Raymundo, Chuarrancho, Villa Nueva, El Jícaro, Rabinal, San Jerónimo, Estanzuela, Cabañas, Gualán, La Unión, Río Hondo, San Martín Jilotepeque, Comalapa, Sta. Apolonia, San Andrés Itzapa, San José Poaquil, Parramos, Zaragoza, Joyabaj, Zacualpa, Patzicía, Patzún, Tecpán, San Antonio Aguas Calientes, Pastores, Sumpango, Sto. Domingo Xenacoj and others.

Most of the systems were provisionally rehabilitated during the first few weeks after the earthquake, but restoration sometimes took several months due to engineering problems as well as hydrological disturbances generated by the earthquake. To cope with water problems communities obtained their water supplies from untreated wells and springs. Despite this fact, very few cases of water-derived illness were reported.

The damage to drainage systems was a more severe problem and presented, by itself, a potential health hazard. The main drainage and sewage systems were slightly damaged in Guatemala City, but scores of secondary and individual systems were cracked or broken. Municipalities restored the secondary systems after the rehabilitation of water supplies and individuals had to restore their own systems. This process lasted for

several months, because most of them were buried at a depth of 1.5 to 4 meters and very little labor was available to do that type of work.

The amount of damage to drainage systems in the other urban centers and rural towns and villages was similar in quantity to the potable water systems. A total of about 323 systems was disrupted. The magnitude of the restoration cost was greater than that for potable water or electricity due to the physical rigidity of the systems and the number of leaks.

The NRC delegated to UNEPAR (the Guatemalan unit for rural water projects) and INFOM (Institute for Municipal Promotion) responsibility for the evaluation and the rehabilitation of the damages to these systems as well as the coordination of the efforts of the communities to help in these programs. Reconstruction lasted from several weeks to several months, depending on the extent and type of damages. The sewage and drainage systems most severely affected were located in the departmental capitals of Antigua Guatemala, El Progreso, Salamá, Zacapa, Jalapa and Chimaltenango. Municipal towns with similar impacts were San Juan Sacatepequez, Santiago Sacatepequez, Cuidad Vieja, Comalapa, Patzicía, Zaragoza, Rabinal, Morales, Estanzuela and San José Poaquíl. Other towns with severe damage in their drainage networks were Fraijanes, San Pedro Sacatepequez, San Pedro Ayampuc, Palencia, Amatitlán, San Bartolomé Milpas Altas, Sta. Apolonia, Parramos, Acatenango, Sta. Cruz Balanyá, Joyabaj, Zacualpa, Sanarate, Morazán, San Agustín Acasaguastlán, San Luis Jilotepeque, San Pedro Pinula, Cabañas, Gualán and La Unión.

Fortunately, the NEC and authorities from the Ministry of Health and Social Assistance took measures to avoid cross contamination occurring

between the filtrations of municipal drainage systems and potable water supplies and very few vectors for gastro-intestinal sicknesses were found.

The most difficult task was the opening of land transportation systems. Four hundred kilometers of roads and highways were partially destroyed and over 1026 large landslides collapsed over the transportation systems and the drainage systems of Samalá, Achiguate, Guacalate, Pantaleón, Madre Vieja, María Linda, Motagua and other smaller rivers.

The Atlantic route (CA-9 North) is the most important highway in Guatemala. Over it comes and goes most of the interchange of goods and services between Guatemala, the Eastern coasts of the U.S.A., Canada and Europe. It is vital to the economy of the country. This highway was damaged and two bridges along it were destroyed. The U. S. Army Corps of Engineers and the Guatemalan Highway Department opened it in record time. About 81 kilometers, two bridges and other supporting roads were made passable in approximately 45 days at a cost of about $7.5 million (URF 1977). The most damaged areas were between Garita El Peaje and San Antonio La Paz, between Sanarate and El Progreso and between El Progreso and Los Encuentros.

The Mexican government helped to open the Western highlands highway (National No. 1), specifically the sector between Chimaltenango, Patzicia, Patzún, Godinez and Sololá as well as the sector from Godinez to San Lucas Tolimán and West, (CA-1) between Chimaltenango, Tecpán and Los Encuentros. They worked hand in hand with the Guatemalan Highway Department and rehabilitated 45 kilometers.

The rehabilitation of these two basic highways plus the opening of the sectors from Guatemala City to Amatitlán; Guatemala City to Antigua Guatemala and Chimaltenango; Guatemala City to San Raymundo; Guatemala City to Mataquescuintla; Chimaltenango to Patzaj; Chimaltenango to Tecpán and Sta. Apolonia; Zaragoza to Comalapa; Guatemala City to San Pedro Ayampuc; San Raymundo to Rabinal; Antigua Guatemala to Acatenango and other sectors was completed in about 55 days. Within three weeks after the earthquake, however, most of these places were reachable by land transportation.

All the heavy highway machinery at the disposal of different government officers was used to open the rest of the transportation systems, specifically 274 kilometers rebuilt or repaired and about 280 cleared or improved in about 90-110 days.

The NEC coordinated initial efforts among Guatemalan government institutions and other highway crews from friendly countries to restore the highway systems and decided upon geographical distribution of the effort to restore the main roads. It also provided logistical support through the army to speed up the decisions and actions needed to re-establish the highway and road system. The NEC stimulated the Guatemalan Highway Department to coordinate the efforts of the U. S. Army Corps of Engineers, the Mexican Highway Department, the Guatemalan Army Corps of Engineers and the other national institutions engaged in these actions and tried to solve any bureaucratic problems that would diminish the effectiveness of the operational agencies. The land transportation systems had to be open as soon as possible because emergency operations

would become easier and supplies would reach more people and the economy of the country could accelerate its recovery.

During the first week, while the highway and roads were being repaired, most emergency supplies were flown in by the Guatemalan Air Force in helicopters and Arava planes. The U. S. Government sent about 14 helicopters to help. Due to their load capacity, this aid was invaluable and permitted the continuous supply of food, medicines, clothes and services as well as the evacuation of severely injured persons.

The Guatemalan Civilian Patrol put at the service of the NEC most of their airplanes, helicopters and pilots and they also provided great help by flying supplies to the most isolated communities. A total of about 40 aircraft, military and civilian, operated continuously during the first two weeks after the earthquake, some of them flying teams of scientists to study natural phenomenon and a few bringing the international press and potential donors to damaged areas.

Requesting and/or Accepting Outside Aid

As soon as the Guatemalan people outside the heavily damaged area knew about the magnitude of the disaster, internal help was organized. The people of Escuintla, Mazatenango, Retalhuleu, Coatepeque, Quezaltenango and San Marcos and surrounding areas sent the first supplies to arrive in the disaster area and they sent their firemen to help and to distribute food, clothes, and other emergency supplies. According to local observers, a tremendous solidarity developed among Guatemalans, rich and poor, in spite of the fact that some of them were in shock because of the magnitude

of the damage. At the same time, most of the people developed a feeling of nationhood or a feeling of national unity that had been dormant in the country for a long time. Social, economic, ethnic, and political diversity had prevented a concept of nation from developing. For the first time the people had a common goal, the rehabilitation and reconstruction of Guatemala.

The President of Guatemala, the Coordinator of the NEC, and some high ranking army officers and civilians were responsible for requesting outside aid. The Guatemalan government and the NEC, through these people, asked for aid from the OAS and other UN agencies as well as neighboring countries. The cooperation of other Central American countries, Mexico and the U.S.A. were spontaneously offered.

As soon as the magnitude of the disaster was known by the Diplomatic Corps, other spontaneous offerings were made by friendly countries and as the world responded, the NEC started requesting specific forms of assistance in detail. The Guatemalan government and the NEC knew that assistance coming from other governments was going to take more time than assistance coming from private organizations, and they therefore started a massive campaign to obtain support from The Red Cross and other Guatemalan and international voluntary agencies.

Aid started to arrive the morning of February 4. Nicaragua, El Salvador, Panama, Honduras, Costa Rica, Mexico and the U.S.A. sent emergency supplies and in some instances, personnel. As the sun rose, supplies were coming in from other continental countries and on February 5, 6 and 7, massive donations of food, medicines, clothes and other goods were

being received, classified and stored by the NEC, which coordinated the general distribution of these supplies.

Although outside aid was requested of foreign governments by the Guatemalan government and the NEC through official channels by the Ministry of Foreign Relations, most of the emergency supplies were brought in by non-government institutions. The largest exception was food supplies that the U. S. government sent to CARE, CARITAS and other North American institutions.

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