

FNAA0535
100-35664

RECOVERY, CHANGE AND DEVELOPMENT:
A LONGITUDINAL STUDY OF THE 1976 GUATEMALAN EARTHQUAKE

Volume I

EDITED BY
FREDERICK L. BATES

Final Report, Guatemalan Earthquake Study. This research was supported by a grant from the National Science Foundation. The authors, and not the Foundation, are fully responsible for the contents of this report.

FOREWORD

The research upon which this volume is based was supported by a grant from the National Science Foundation and supplemented by a contract with the Agency for International Development for special research on food programs. The grant was made in June, 1977, for a three year period and was later extended through November of 1982.

The National Science Foundation grant was made to the University of Georgia where the Principal Investigator, Dr. Frederick L. Bates, is employed as a Professor of Sociology. Sub-contracts were signed between The University of Georgia and The Pan American Health Organization, the parent organization for The Instituto de Nutricion de Centro America y Panama, Guatemala City, Guatemala and The University of Colorado Health Sciences Center, Denver, Colorado, where the two Co-Principal Investigators were employed. Similar arrangements pertain to the contract with the Agency for International Development - Food for Peace.

Field work for the research was carried on through cooperation with INCAP and under the direction of its personnel, with the Principal Investigator and Co-principal Investigators being responsible for much of the data collection effort. Dr. W. Timothy Farrell, Co-principal Investigator, who was Coordinator, Program in Rural Development, Division of Human Development, INCAP, was in direct charge of the field work operation during the data collection phase. He was assisted in the City by Dr. JoAnn K. Glittenberg, Professor of Anthropology in the School of Nursing at the University of Colorado Health Sciences Center, Denver, Colorado, who was particularly responsible for dealing with the data collection in the urban

settlements. Mr. Thomas E. Edwards served as Field Supervisor of the interview team which consisted of the following individuals:

Nicolasa Cuc Cuxulic
Maritza Del Aguila Gómez
Sheila Góngora Román
Ivonne Martínex Telón
Abelina Mendoza Moctezuma
Rosa Pérez Vides
Mercedes Ramírez Peralta
Nora Sánchez Santizo
Violeta Gálvez Garcia
Mauricio Segura

Towards the end of the field work period Dr. W. Timothy Farrell left INCAP to become Director of the Foster Parents Plan International in Colombia and was replaced as Co-principal Investigator by Dr. Robert E. Klein, Chief of the Division of Human Development, INCAP, Guatemala City, Guatemala.

From the beginning of the project, Mr. Charles D. Killian managed the computer analysis of the data and, after the first year, was joined by Mr. Walter G. Peacock who served as a research assistant for the remainder of the project. During the last two years of the work, Mr. Daniel G. Rodeheaver, who had served as a Peace Corps volunteer in Guatemala during the two previous years, joined the staff of the project and concentrated on the analysis of food data. For approximately a year Dr. Glittenberg was assisted in research in the City in gathering data from the Guatemalan government by Mrs. Maria del Carmen de Stewart. During the course of this

research, Drs. John C. Belcher and Elwood M. Beck of the University of Georgia gave valuable advice, and assisted in the interpretation of data.

Special thanks are due to Dr. Luis A. Ferraté of the Interamerican Development Bank, Washington, D. C. (formerly a member of the National Committee for Reconstruction in Guatemala) who assisted in the writing of the final manuscript and also served as a critic and editor. Throughout the course of the research, the Project Advisory Committee offered valuable advice and suggestions and assisted in solving the many methodological and theoretical problems faced in the research. Particularly, thanks go to Mr. Leon O. Marion who helped the Principal Investigators stay in close contact with the voluntary agency community. The members of the Advisory Committee were:

Dr. Brian J. L. Berry
Dean, School of Urban and
Public Affairs
Carnegie-Mellon University
Pittsburgh, Pennsylvania 15213

Mr. Gabino Carrillo
American National Red Cross
18th and E. Streets, N. W.
Washington, D. C. 20006

Mr. Alex R. Cunningham
Office of Emergency Services
P.O. Box 9577
Sacramento, California 95828

Dr. Paul L. Doughty
Department of Anthropology
University of Florida
Gainesville, Florida 32611

Dr. Mary L. Elmendorf
Consultant to the World Bank
1514 - 17th Street, N.W.
Washington, D. C. 20036

Dr. William S. Hoffnagle
Deputy Director for Technical
Assistance for the Foreign De-
velopment Div.
Economic Research Service
U.S. Department of Agriculture
1735 N. Lynn Street
Arlington, Virginia 22209

Dr. William P. McGreevey
Program Dir., Battelle Institute
2030 M. Street, N.W.
Washington, D. C. 20036

Mr. Charles S. Manfred
(formerly) Dir., Office of
Emergency Services
State Government of California
Sacramento, California

Mr. Leon O. Marion, Exec. Dir.
American Council of Voluntary
Agencies for Foreign Service, Inc.
200 Park Avenue, S.
New York, New York 10003

Mrs. Anne Martindell
(formerly) Director
Office of U.S. Foreign Disaster Asst.
A.I.D.
Department of State
Washington, D. C. 20523

Dr. Sonia Rosenbaum
(formerly) Social & Demographic
Research Institute
W. 34 Machmer Hall
University of Massachusetts
Amherst, Massachusetts 01002

Mr. Joseph A. Mitchell, Dir.
Office of U.S. Foreign Disaster Asst.
A.I.D.
Department of State
Washington, D. C. 20523

Dr. Ralph H. Turner
Department of Sociology
Univ. of California, Los Angeles
Los Angeles, California 90024

Dr. Donald R. Nichols, Chief
Engineering Geology Branch
U.S. Dept. of Interior Geological
Survey
Box 25046 M.S. 903
Denver Federal Center
Denver, Colorado 80225

Dr. Walter M. Vannette
Box 15200
University of Northern Arizona
Flagstaff, Arizona 86011

The Principal Investigators are also indebted to the individuals who served as Program Directors for the project for the National Science Foundation and Food for Peace. Much good advice and practical assistance was given by these people. They were Dr. George W. Baker, Dr. James D. Cowhig, Dr. William A. Anderson and Ms. Carolyn Weiskirch.

This monograph will appear in two volumes. The first to which this foreword is appended, deals with the general theoretical and methodological background of the research, summarizes the Guatemalan government's response and analyzes food programs. The second volume covers housing and general economic changes as well as cultural differences in recovery and provides the final summary and conclusions for the research.

This research would not have been possible without the dedicated efforts of the field workers and research assistants mentioned above and especially without the extraordinary contributions of Hettie Bates who served as project secretary and "psychiatric" counselor for the staff throughout the five-year period covered by this research.

ABBREVIATIONS AND ACRONYMS USED IN THE TEXT

<u>Initials in the Text</u>	<u>Name and Initials in Spanish</u>	<u>Name in English (Translation)</u>
AID	Agencia para el Desarrollo Internacional - ADI	Agency for International Development
BANDESA	Banco Nacional de Desarrollo Agrícola - BANDESA	National Bank for Agri- cultural Development
BANVI	Banco Nacional de la Vivienda - BANVI	National Housing Bank
CARE	Cooperativa Americana de Remesas al Exterior - CARE	Cooperative for American Relief Everywhere, Inc.
CRS	Servicios Católicos de Ayuda - CARITAS	Catholic Relief Services
COGUANOR	Comisión Guatemalteca de Normas- COGUANOR	Guatemalan Standards Commission
CONASUPO	Compañía Nacional de Sub- sistencias Populares - CONASUPO	National Company for Basic Necessities
CORFINA	Corporación Financiera Nacional- CORFINA	National Financing Corpora- tion
EPS	Ejercicio Profesional Supervis- ado - EPS	Supervised Technical Uni- versity Exercise
FEER	Fondo Extraordinario Específico de Reconstrucción - FEER	Specific and Extraordinary Fund for Reconstruction
FHA	Instituto de Fomento de Hipotecas Aseguradas - FHA	Institute for the Promotion of Insured Mortgages
GG	Gobierno de Guatemala	Guatemalan Government
GSNCEP	Secretaría General del Consejo Nacional de Planificación Económica - SGCNPE	General Secretariat of the National Council for Economic Planning
GISS	Instituto Guatemalteco de Seguridad Social - IGSS	Guatemalan Institute for Social Security
GUATEL	Empresa Guatemalteca de Comunicaciones - GUATEL	Guatemalan Enterprise for Communications

<u>Initials in the Text</u>	<u>Name and Initials in Spanish</u>	<u>Name in English (Translation)</u>
ICAITI	Instituto Centroamericano de Investigación y Tecnología Industrial - ICAITI	Central American Institute for Research and Industrial Technology
INDECA	Instituto Nacional de Comercialización Agrícola - INDECA	National Institute for Agricultural Commercialization
INFOM	Instituto de Fomento Municipal - INFOM	Institute for Municipal Development
INTECAP	Instituto Técnico de Capacitación - INTECAP	Technical Training Institute
INSIVUMEH	Instituto de Sismología, Volcanología, Meteorología y Hidrología - INSIVUMEH	Institute of Seismology, Volcanology, Meteorology and Hydrology
NEC	Comité Nacional de Emergencia - CEN	National Emergency Committee
NGOs	Organizaciones No Gubernamentales - ONGs	Non-Government Organizations
NICU	Unidad de Cooperación Nacional y Internacional - UCNI	National and International Cooperation Unit
NIE	Instituto Nacional de Electrificación - INDE	National Institute for Electricity
NIF	Instituto Nacional Forestal - NIF	National Institute of Forestry
NIG	Instituto Geográfico Nacional - IGN	National Institute of Geography
NRC	Comité de Reconstrucción Nacional - CRN	National Reconstruction Committee
OAS	Organización de Estados Americanos - OEA	Organization of American States
OXFAM	Comité de Oxford para Auxilio de Hambre	Oxford Committee for Famine Relief
PPIU	Unidad de Información, Programación y Planificación - UIPP	Planning, Programming and Information Unit
PRU	Unidad de Reconstrucción Física - URF	Physical Reconstruction Unit

<u>Initials in the Text</u>	<u>Name and Initials in Spanish</u>	<u>Name in English (Translation)</u>
SPU	Unidad de Promoción Social - UPS	Social Promotion Unit
UNEPAR	Unidad Ejecutora y Planificadora de Acueductos Rurales - UNEPAR	Planning and Executive Unit for Rural Aquaducts
URPAC	Unidad de Rescate del Patrimonio Cultural - URPAC	Cultural Heritage Rescue Unit
USAC	Universidad de San Carlos	University of San Carlos

TABLE OF CONTENTS

Chapter		Page
Chapter	1 Disasters, Social Change and Development Frederick L. Bates	1
Chapter	2 Research Design and Field Work Methodology W. Timothy Farrell and Frederick L. Bates	37
Chapter	3 The Disaster and the Guatemalan Government's Response Frederick L. Bates, Luis A. Ferraté and Robert E. Klein	86
Chapter	4 The Origin of the National Reconstruction Committee and the Setting of Policy With Respect to the Reconstruction Process Frederick L. Bates, Luis A. Ferraté and Robert E. Klein	139
Chapter	5 The Disaster Related Social System Frederick L. Bates	227
Chapter	6 Emergency Food Distribution and its Appropriateness . Frederick L. Bates, Daniel G. Rodeheaver and Robert E. Klein	259
Chapter	7 The Impact of Emergency Food on Food Prices and Production Charles D. Killian, Frederick L. Bates and Robert E. Klein	298

LIST OF TABLES

Table No.		Page
2-1	Characteristics of the Research Design	43
2-2	Community Sample Design	47
2-3	Communities Selected for the Research	49
2-4	Example of Interval Sampling (Santa Maria Cauque)	54
2-5	Sampling Data 1978 (EQ01).	56
2-6	Communities Interviewed in Phase II	58
2-7	Attrition Rates Phase I - Phase III	60
2-8	Reasons for Not Obtaining Interviews - Phase I	64
2-9	Attrition Phase I to Phase II.	65
2-10	Reasons for Attrition from Phase I to Phase III.	66
2-11	Pretest Distribution	74
3-1	Damage Estimates Provided the Guatemalan Government by GSNCEP, March 1976	110
6-1	Food Shortages Reported in Individual Households Following the Earthquake	260
6-2	Food Shortages in Households Classified by Political Status for City and Experimental Group	264
6-3	Length of Food Shortage for those Who Perceived a Food Shortage Only	266
6-4	Perceptions of Food Shortages in a Sub-sample of Experimental Group Households Three Years After the Earthquake	269
6-5	Perceptions of Whether Food Distribution was Excessive or Not in a Sub-sample of Experimental Group Households Three Years After the Earthquake	269
6-6	Answers to Question: Do You Think That Such Things as Food, Clothing and Houses Should Not be Given Away to People Affected by a Disaster?	270

LIST OF TABLES

Table No.		Page
6-7	Proportion of Food Produced by Household for Home Consumption, Classified by Control, Experimental Group and City	272
6-8	Production and Sale of More than \$50 Worth of Agricultural Products in 1975 by Households in Control-Experimental Group and City	272
6-9	Sources of Food Following the Earthquake Classified by Experimental, Control Group and City	275
6-10	Sources from Which Food was Obtained, Classified by Region .	277
6-11	Number and Percentage of Families Receiving Food from Agencies in the Control, Experimental Group and City	278
6-12	Distribution of Responses to Questions Asking About Specific Foods in Short Supply and Received from an Agency for the Control, Experimental Group and City	280
6-13	Number and Percentage of Respondents Reporting Shortages and Reporting Receiving Various Foods from an Agency	283
6-14	Definition of Success and Failure in Food Distribution . . .	285
6-15	Experimental Group Households Reporting Food Shortages Classified by Whether They Received Food or Not	287
6-16	Success and Failure in the Distribution of Ten Basic Foods: Food Need Cross Classified by Food Receipt	289
6-17	Success and Failure of the Distribution of Beans and Corn .	292
6-18	Success and Failure in Emergency Food Distribution in Different Size Communities in the Experimental Group (Food Shortage Cross Classified by Food Distribution and Political Status of Communities)	296
7-1	Perceptions of Food Price Changes in the Control, Experimental Group and City	302
7-2	Perception of Food Program Impact on Food Prices for Control, Experimental Group and City	304
7-3	Distribution of Answers to the Question: Do Food Programs Help?	306

LIST OF TABLES

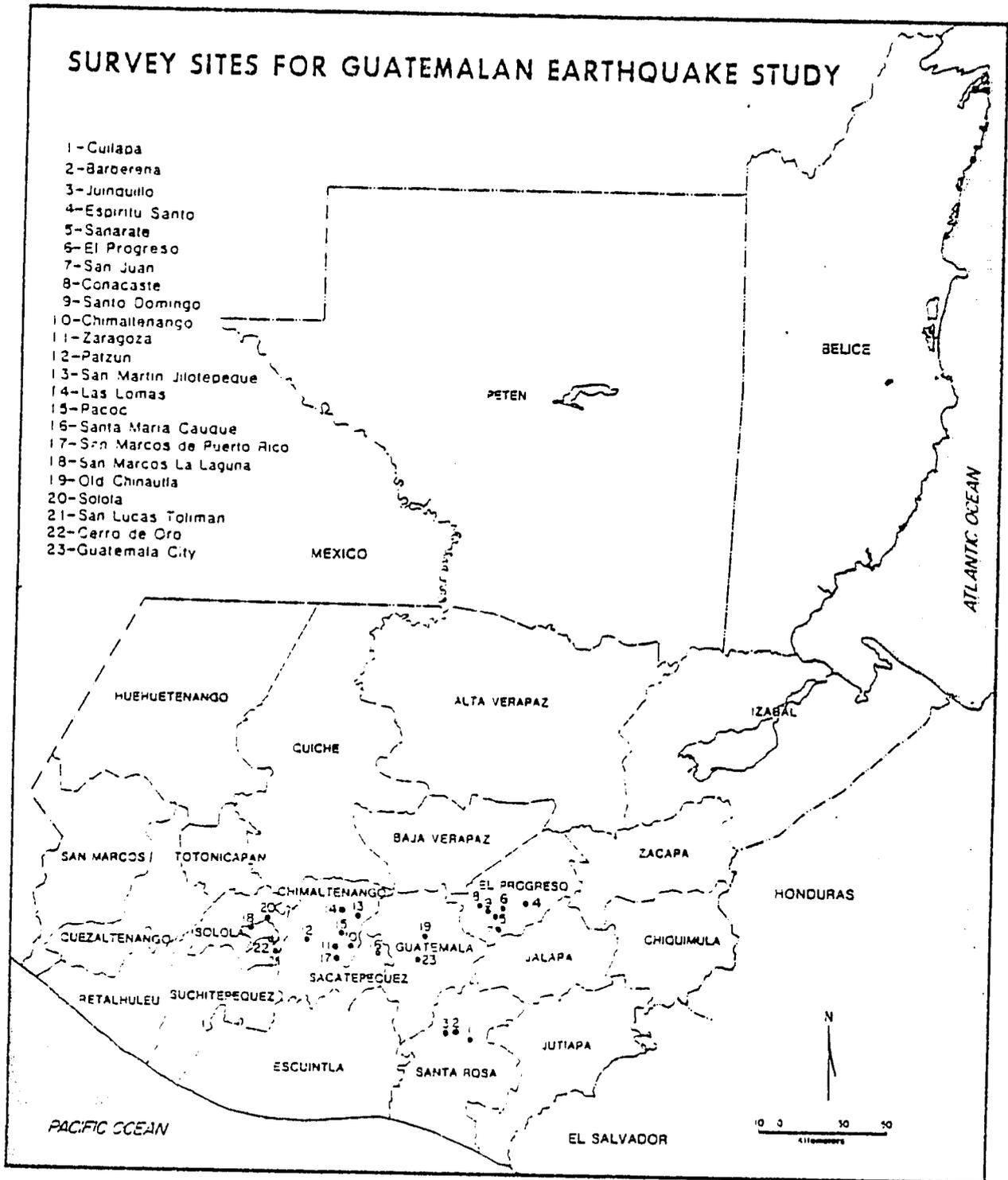
Table No.	Page
7-4	Distribution of Answers to the Question: Are Food Programs Fair or Just? 306
7-5	PL-480 Food Distribution in Guatemala During 1976 308
7-6	PL-480 Food Distributed in Guatemala January 1976-December 1976 309
7-7	PL-480 Food Products Distributed by CARE and CRS in Guatemala January 1, 1974 - December 31, 1979 313
7-8	Comparison of Basic Grain Production with PL-480 Imports 1974-1979 316
7-9	Production of Four Basic Foods in Guatemala 1970-1980 Showing Changes in Production Each Year Compared to the Previous Year (In Thousands of Metric Tons) 319
7-10	CARE and CRS Distribution of Commodities in Guatemala July 1973 to March 1980 (in thousand pounds) 326
7-11	Average Monthly Prices per Hundred Weight for Black Beans . . 328
7-12	Regressions of Price of Black Beans/100 wt. on PL-480 Food Distribution and Control Variables 333
7-13	Regressions of Price of White Corn/100 wt. on PL-480 Distribution and Control Variables 339
7-14	Regressions of Price of Yellow Corn/100 wt. on PL-480 Food Distribution and Control Variables 430
7-15	Average Monthly Prices per 100 Weight for White Corn 431
7-16	Average Monthly Prices per 100 Weight for Yellow Corn 434

LIST OF FIGURES

Figure No.		Page
1	Metric Tons of Corn Produced Annually 1970-1980	320
2	Metric Tons of Beans Produced Annually 1970-1980	321
3	Thousands of Pounds - Pinto Beans - Distributed Through PL-480 Programs	327
4	Black Beans Monthly Prices Per Hundred-weight Jan. 1973- August 1979	329
5	Black Beans - Actual & Predicted Monthly Prices January 1973-August 1979	335
6	Black Beans - Estimated Differences in Price Associated With PL-480 Bean Distribution: January 1973-August 1979 .	336
7	Thousands of Pounds Yellow Corn Distributed Through PL-480 Programs.	338
8	White Corn - Monthly Prices per Hundred-weight January 1973-August 1979	342
9	Yellow Corn - Monthly Prices Per Hundred-weight January 1973 - August 1979	345
10	White Corn - Actual & Predicted Monthly Prices January 1973 - August 1979	347
11	Yellow Corn - Actual & Predicted Monthly Prices January 1973 - August 1979	348

SURVEY SITES FOR GUATEMALAN EARTHQUAKE STUDY

- 1-Cuilapa
- 2-Barberena
- 3-Juinquillo
- 4-Espiritu Santo
- 5-Sanarate
- 6-El Progreso
- 7-San Juan
- 8-Conacaste
- 9-Santo Domingo
- 10-Chimaltenango
- 11-Zaragoza
- 12-Patzun
- 13-San Martin Jilotepeque
- 14-Las Lomas
- 15-Pacoc
- 16-Santa Maria Cauque
- 17-San Marcos de Puerto Rico
- 18-San Marcos La Laguna
- 19-Old Chinautla
- 20-Solola
- 21-San Lucas Toliman
- 22-Cerro de Oro
- 23-Guatemala City



11

Chapter 1

Disasters, Social Change and Development

Frederick L. Bates

Introduction

On February 4, 1976 at 3:00 A.M., Guatemala was struck by a devastating earthquake which measured 7.5 on the Richter scale and lasted 33 seconds. Over 25,000 people were killed and 75 000 severely injured. In addition, more than a million were left homeless as their houses collapsed under the heavy impact. Whole towns were completely leveled, and hundreds more were so heavily damaged that normal life patterns could not resume without massive relief and reconstruction efforts. Almost immediately assistance began to arrive from abroad as foreign governments responded to Guatemala's plight and as hundreds of voluntary organizations rushed in to be of assistance.

This monograph reports on a study of the massive reconstruction process that followed these events. The primary objective of the research upon which it is based was to examine in detail the hypothesis proposed by Samuel H. Prince in his 1920 study of the Halifax ammunition ship explosion, that major disasters foster rapid social change (Prince 1925). A second, but equally important and compatible objective was to evaluate the effects of reconstruction programs on the recovery of Guatemalan households and communities. Since recovery is a form of change, and since reconstruction programs can bring about innovations and have long-range development impacts, then by evaluating such programs in terms

of their impact, social change is also being examined.

A third way to interpret the objectives of this study is to think of it as a study of the impact of a major disaster and of the accompanying reconstruction process on the development process going on in a developing country. Thus, throughout this study questions are asked about how various forms of aid and of aid organizations impacted upon the development process in Guatemalan society. Development is a change process, and therefore when impacts on development are examined, the causation of social change is being assessed also.

It is important to realize that the changes produced by disasters might impede or reverse the development process, speed up existing development trends or foster new ones (Bates et al 1963, Wiseberg 1976). Which direction is taken in the change process that occurs following disasters will depend upon the nature of the human interventions that take place during the relief and reconstruction process. Some interventions will have negative development impacts, while others will have positive ones. One of the objectives of this research is to examine different kinds of interventions in order to draw at least tentative conclusions concerning their relationship to development.

Social Change and Disasters

There are a number of theoretical reasons to expect that the Prince hypothesis is correct and that disasters and their accompanying interventions during the relief and reconstruction processes play a significant role in the social change processes going on in a society. First is the fact that large scale disasters, which affect whole large communities or

major segments of whole societies, put the social structure of that system to the test. In particular, the power structure as expressed in governmental institutions and in stratification systems is placed under extreme stress. It is required to respond quickly and effectively to an emergency which can neither be side-stepped nor ignored. There is consensus that those in power are obligated to respond to the needs of victims and to take steps to restore the social system to a semblance of normal operation (Glantz 1976). Whatever weaknesses exist in the structure of the system stand out in bold relief against the background of crisis. Inefficiency, duplication, corruption, incompetence, inequity and other deficiencies in the organization of the system are laid bare for all to see. As a consequence, the political leadership of the affected unit is put on trial, and their performance is measured against the human needs exacerbated by the disaster and against humanitarian values which come to the foreground in disaster situations (Wiseberg 1976, Glantz 1976).

A second reason disasters are likely to lead to social change is that they create a situation favoring the formation of new associations and new alliances by bringing together groups and categories of people who, under normal circumstances, are isolated from or even hostile towards each other. For a brief period following disaster, when emergency considerations are dominant, a consensus develops and people normally in conflict work together towards common goals. The divisions fostered by culture, ethnicity, social class and urban-rural differences are temporarily set aside as a "therapeutic community" arises for a period (Fritz 1961, Hill and Hansen 1962). This period may provide a brief insight

into how these normal divisions and antagonisms which are built into the social structure inhibit and limit the progress of the society towards development goals. Later in the reconstruction process, the old divisions are likely to reassert themselves, but the period of joint effort may leave a lesson in the minds of some that changes their perception of their society, and their aspirations for the future. Especially where pronounced inequities exist, and where poverty is the rule of life, the concept that things can be accomplished by concerted effort, when the power structure works with or for the people, may have long-range consequences (Bates et al 1963).

Still a third reason to expect an impact on development is the fact that groups from outside the society flock in to help and at the same time to promote their own agendas which may be aimed toward producing change in the society, using disaster assistance as a tool. These outside organizations include those from other parts of the impacted country as well as those from abroad. They often bring with them new ideas and different patterns of organization and operation than are present in the victim community and they transmit these through association with disaster victims. There follows a period of cultural and technological transfer which is often accompanied by changes in values and attitudes. This cultural diffusion can hardly escape leaving its mark on the disaster stricken community or society.

Furthermore, the kinds of assistance offered and the way it is organized and delivered may serve to create dependency and weaken the capacity of the society to develop after the helping agencies leave or

it can strengthen the society's leadership infrastructure and fuel the engine of development (Carmack 1978, Franke and Chasin 1980). Similarly, technological transfers may be inappropriate to the resource base of the country and compound the problem of dependency or even lead to greater disaster vulnerability in the future, or they can build upon the technology present in the society and lead to greater technological independence, and greater disaster resistance in the future (Cleaver 1979, Glantz 1976).

The process of offering aid may also reinforce the existing social order in the society by delivering aid through channels and by techniques that reflect existing inequities, thus benefiting those in power more than those who lack it, or it can ignore that social order and in the long run produce changes in the power structure and stratification system (Berg 1975, Lappe and Collins 1977, Carmack 1978). Existing leaders and persons of authority may be strengthened or new leaders may be developed and new constituencies be created by the process through which outside agencies offer aid. When such agencies leave, or shift their activity away from reconstruction to more traditional development activities, they may leave behind a legacy which has heightened conflict among factions or which has strengthened some and weakened others, or they may have created a new system for cooperation in a long-range development process (El-Khawas 1976).

There is also the fact that disasters offer opportunities for outside agencies and groups to gain a toe-hold in the society and to develop a constituency for future activities. In the Guatemalan case many outside groups came to Guatemala for the first time and after the reconstruction

process was over remained to carry on various activities, some of which were aimed towards development, and all of which had some form of social change objective. Many left only when political instability associated with guerrilla and anti-guerrilla activity forced them to do so, often under the threat of violence, presumably based on opposition to their influence on the change process going on in Guatemala.

Along with the outsiders comes a flood of resources, sometimes greater than have ever been available during a short span of time in the history of the impacted country. These resources include money, material, expertise and manpower beyond what could ordinarily be invested in the development process. Although their avowed purpose is to provide emergency relief and to support reconstruction, these activities can not be carried on without impacting upon the development process. When the reconstruction programs are complete, they leave behind the effects of this tremendous investment on the society in question, not to mention the ripple effects that this investment has during a period following the disaster.

Finally, change can be expected following a disaster because disasters destroy the capital, both physical and human, of the impacted community. These must be replaced, and when they are, especially in the case of physical infrastructure, the capital equipment is updated. In short, what may happen is that worn and outdated buildings, machinery and equipment will be replaced by new more modern substitutes. This may have a long-range impact on the productivity of the society or, as pointed out above, it may completely change its dependency relationship to the world system in which it exists.

For all of the reasons listed above, it is reasonable to expect social change to intensify following a major disaster and perhaps also to expect new directions of change to emerge. In an underdeveloped society experiencing a large scale disaster, where the international community responds with massive aid, it is almost inconceivable that there would be no impact on the development process in the society. Such a disaster as occurred in Guatemala is one of those tremendously significant historical events which represent water sheds in the development of a social system and have long-range historical ramifications.

Theoretical Perspective

As a guide to the research to be reported here, it was necessary to employ a theoretical perspective which simultaneously takes into account a conception of disaster and disaster related social phenomena, and a conception of social change and development. This perspective begins with the notion that the disaster agent, in this case an earthquake, which stems from the natural environment, interacts with a socio-cultural system to produce the disaster itself. In a sense, the physical agent is an independent or causal variable which acts upon an existing human system and thereby produces the resultant consequences, which are perceived as the disaster itself. The damage and loss suffered by homes and public buildings, as well as the injuries and loss of life which occur, are the effects of interaction between the natural phenomenon, the earthquake, and the response of the human sociocultural system to it (Berg 1975).

This means that the actual destruction suffered is as much a product of the human system and the artifacts it employs as the physical phenomenon which produces the impact. In one society people may live and work in aseismic structures and experience a 7.5 Richter Scale earthquake as an unpleasant and perhaps frightening shaking of the earth which causes minor damage and inconvenience, while those living in a different society which employs a vulnerable physical infrastructure, will see their houses collapse, and many of their fellow citizens killed or injured. The difference lies in the relationship between the human system, its material culture, and natural environmental forces (Berg 1975).

In a similar fashion, everyone in the same society is not exposed equally to loss from the same disaster agent. Different segments of the same society may employ quite different material cultures, or may be differentially situated geographically with respect to natural hazards associated with the disaster agent. For example, the poor may live on hillsides or in ravines where earthquake produced landslides expose them to secondary impacts stemming from the earthquake, or they may live in dwellings that are more fragile and dangerous.

For these reasons it is to be expected that in the Guatemalan case, the amount of damage and loss suffered by people, proportional to their existing resources would vary according to such social variables as social class, ethnicity, rural-urban residence, and type of community. These variables express dimensions of sociocultural structure likely to make a difference when the physical impact interacts with the human system.

It is also to be expected that secondary and tertiary impacts which follow the actual physical event, the earthquake, will produce different social and economic consequences for different groups of people. For example, a food shortage following a disaster will have far different significance for those who have large financial resources, and connections to the modernized distribution system, than to those who are destitute and isolated.

It is apparent from these considerations that a disaster is not a single event with only a single moment or interval of impact, but because of the dependent events it produces, there emerge waves of secondary or tertiary impacts that work their way through the social system as that system responds to the event. If food shortages occur as a result of the disaster, these will produce their own impact, and if looting occurs in response to food shortages, a tertiary impact is felt, and so forth, until the sociocultural system readapts to the set of environmental conditions that prevail around it.

An earthquake, such as that of February 4th in Guatemala, therefore is a triggering event which interacts with a sociocultural system and produces consequences for the human population and its organized social life. But these consequences themselves produce consequences which reverberate through the system for considerable time following the original impact. They are like aftershocks produced by the larger system containing the society and its physical environment as interacting parts.

Once the initial physical shock is over and an emergency focused and then a reconstruction focused social system forms out of internal and external aid sources that converge upon the disaster scene, a new set

of independent variables enters into the disaster equation. These relief and reconstruction inputs in the form of money, material, personnel and human organization begin to act upon the system and upon its environment in an attempt to mitigate and ameliorate the human consequences of the disaster. As they do so, they begin to stabilize the relationship of the sociocultural system to its environment and to restore its material culture and social organization to a state in which it again provides an adaptation of the affected human population to that environment.

These relief and reconstruction inputs, most of which enter from outside the affected segment of the social system, represent a new set of causal or independent variables or influences which act upon the sociocultural system and also upon the environment, changing them internally and altering their relationship to each other as time progresses beyond the initial impact phase. The changes referred to, once the destructive force of the disaster has altered the affected system, may be changes which merely restore the system and its relationship to its environment to its predisaster condition or they may be such as to permanently alter the system and its relationship to its environment.

At this point it is important to recognize that there are two change phases being referred to. One refers to changes wrought by the disaster agent in interaction with the sociocultural system. Such changes are measured in terms of damage and loss, or disruption of normal social and economic functioning. The second set of changes moves the system from this disrupted and devastated condition towards a state of normal or near normal functioning. This is like saying a disaster has a course

like a disease. First, there is the alteration in the functioning of the organism as it is affected by a microorganism and it descends into a state of illness. If followed by the proper treatment inputs, antibiotics for example, the organism begins to recover and if it survives, arrives at a state of relative health.

But disasters, like illnesses, may leave permanent marks on the sociocultural landscape, and the society may never "fully recover." Unlike diseases, the disaster recovery process may result in permanent alterations in the sociocultural structure which are judged to be positive improvements in the system and its relationship to its environment. These permanent alterations which result in the system being different than it was before the disaster, even though recovered in the sense that the damage and loss, and the social disruption caused by the disaster have been repaired, are what Prince was referring to as social change.

Obviously such changes may be judged to be positive or negative in terms of a set of values used as criteria of evaluation. The concept "social and economic development" employs such a set of values to judge the desirability of change (Goulet 1979). The values chosen as the basis of evaluation may vary from one society to another, and from one individual to another and are essentially matters of ideology. But if social change is to be evaluated in terms of its long-range desirability, there is no escaping the necessity to choose criteria upon which to do so, and there is likewise no escape from the responsibility that such choices place on the choice maker. Such criteria are of necessity

arbitrary, even though they are supported by a well accepted, and rounded ideological position. Neither ideologies nor evaluation criteria based on them are absolute but matters of sociocultural definition (Berger 1974).

Notwithstanding these observations, the concept social and economic development is useful as a means of articulating a set of values related to what are judged to be positive as opposed to negative social changes in a society, in terms of its own accepted ideological position. It is even useful to evaluate change in terms of development on the basis of international standards, if on the one hand the standards are recognized as being relative and not absolute, and on the other hand are stated clearly and unambiguously so that proponents and opponents can know what they are arguing about.

For purposes of this study, changes will be regarded as developmental if they meet several criteria which are based on a minimal set of assumptions. The assumptions are as follows. First, it is assumed that sociocultural systems exist to satisfy the biological needs of the population of human beings who make them up. These biological needs are satisfied by providing an adaptation to an environment in which there is a particular set of resources and resource limitations. In order for the population to survive over a long period and for the sociocultural system to meet its biological needs through providing an adaptation to its environment, it will have to establish a relatively stable relationship to that environment which does not destroy or deplete it and thereby threaten future biological adequacy. In short, it is assumed that the survival of the sociocultural system as a system in relative balance

with its surrounding circumstances is desirable.

There is an additional assumption which is made. It is assumed that the satisfaction of human biological needs should be such as to allow the individual to reach his or her full biological potential for health and well-being and to survive in such a state for a normal life span without threat of preventable diseases, injury or violence. It is tempting to add assumptions concerning psychological and social well-being to this basic assumption of biological rights, but to do so would introduce ideological controversy as well as scientific imponderables. If the biological assumption alone is made, there is a greater likelihood of agreement on what constitutes development.

Under this assumption, development amounts to achieving a higher level of adjustment of a sociocultural system to its environment and a higher level of satisfaction of human biological needs. Furthermore, the reduction in such things as preventable diseases, malnutrition, infant and maternal mortality become measures of development as do such things as increases in life expectancy (Heriot 1979). More importantly, changes in the human sociocultural system known to be associated with producing such trends become measures of development. For example, improvements in sanitation are known to affect morbidity and mortality. Therefore changes of this sort which do not have the side effects of depleting resources and creating long-range impacts upon the environment which will feed back upon nutrition or other biological needs are also measures of development. Similarly, improvements in housing which can be demonstrated to be associated with improvements in health and

human biological welfare, and not to be counter-productive with respect to other segments of the system, are developmental. More important to the study of disaster is the idea that improvements in aseismicity with respect to manmade structures of all kinds which do not at the same time result in resource depletion and future economic vulnerability which will have negative biological effects such as lowered nutrition, due to environmental damage, are clearly indices of development.

The argument with respect to developmental change becomes complex and indirect when consideration is given to changes in human organization as opposed to the products produced by that organization. Houses have significance for biological well-being. They also have significance for social status and for aesthetic and psychological satisfaction. But perhaps more importantly, they are produced by human systems utilizing a technology. Certain types of structures are built using a given technology and that technology implies a form of social organization. Both the technology and the social organization it implies undoubtedly have long-range impacts upon the sociocultural system's ability to adapt to its environment and to satisfy human biological needs. Those technologies which depend least on externally produced products and resources and which employ local products and resources in a manner which does not threaten long-range resource depletion and environmental damage are probably more likely to produce development, or at least to prevent a decline in level of development. Furthermore, those forms of human organization which are self-sustaining and which can seek more adaptive solutions to local problems of adaptation are also more likely to produce

sustained development or to prevent decline.

Therefore movement in the direction of local independence from external resources, or from avoidable dependence on foreign technologies, and towards the use of local human organizational resources are also believed to be evidences of development. This means that evidence of increasing dependency which results in resource depletion, or in lower levels of adaptation to environmental conditions and an eventual lowering of human biological well-being are evidences of a declining rather than rising level of development.

All of these comments have great implications for the change processes that follow disasters and especially for the roles play by human intervention programs carried out by disaster relief and reconstruction agencies.

In particular they raise questions concerning the relationship between the type of aid offered, the manner in which it is delivered and the production of social change in the impacted society or community. Programs designed to offer disaster assistance, whether emergency or reconstruction oriented, deliver particular kinds of assistance. This assistance is delivered under a particular set of conditions using criteria that act to select recipients. In addition, aid programs employ specific technologies and human organizational patterns as delivery systems. Each of these separate aspects of disaster assistance programs has significance for social change and development. They also have significance for the relative effectiveness of aid programs in mitigating the effects of a disaster.

Several questions immediately arise concerning the relationship between the form that aid takes and disaster recovery. For example, what kinds of aid are needed to mitigate the effects of specific types of disasters in particular sociocultural settings? How do various types of aid inputs affect the development process? What conditions should be set on the delivery of different types of aid, that is, what criteria should be employed to determine who will receive what types of aid in what amounts? How do different criteria relate to speed and effectiveness of aid delivery in terms of meeting program objectives, and how do they affect long range development? What type of human organization should be used to structure the delivery system for different kinds of aid and how does that structure impact upon recovery and upon development?

These questions raise issues concerning how the aid process itself is organized and how that organization is related to the process of disaster recovery and to social change and development. Translated into more concrete terms they touch upon substantive issues such as those selected for illustration below.

1. What should be done about temporary shelter following an earthquake in a country such as Guatemala? Should the government, or outside agencies, obtain and deliver tents or other similar temporary shelters? Should refugee style camps be established to house victims? How much money should be expended upon such activities considering the need for long range permanent housing reconstruction? Can the people provide their own temporary shelter, or could low cost materials be provided which will allow victims to erect their own? What are the implications of each of these options for the short range emergency situation and for the long range recovery process?
2. Is food aid needed following a disaster such as the Guatemalan earthquake? Is fo, for how long is it needed and what in

particular should be distributed? Should it be given away free or should it be sold at regular or subsidized prices? How should it be distributed, and who should receive it? Does food aid have long range negative impacts on agricultural development? Does it produce dependency or is it essential to mitigate the negative nutritional effects of post-disaster situations? How do the way food is delivered and the types of food chosen for delivery relate to these issues?

3. What should be done about permanent housing following a massive disaster such as the Guatemalan earthquake? Should victims be removed from the disaster scene to temporary centers while housing programs are organized and executed, or should they be left where they are and given assistance in rebuilding on their own? Should short range individual temporary houses be built to house victims for the period during which permanent housing programs are being organized and executed? Or, should only permanent housing be considered? Should programs supply building materials only and depend upon victims to do the actual building of housing for themselves? Under what conditions should people be given housing assistance free? Should they be required to pay at least a nominal sum for it? Should housing programs designed to build whole houses in a pattern similar to constructing a housing development be conducted entirely by agency personnel or those they hire, or should victims be required to supply management and labor in the process of construction? What effects do these various alternatives have on future earthquake vulnerability, and on development issues?

The numerous questions asked above translate the abstract concern over the impact of aid programs on recovery and ultimately on development into a host of practical issues that face those who manage various aspects of disaster relief and reconstruction in developing countries. The implication behind them is that every choice that is made has its costs and its benefits, and as a consequence, has significance for the future welfare of the impacted system. Underlying these practical questions are a series of general theoretical issues or concerns that trouble those who manage or participate in disaster relief operations in the developing world. These issues express an awareness of the significance of the relationship between disasters and development and at the same time state

fundamental problems involved in the value orientation or philosophies that guide the design of aid programs.

The Issue of Cultural and Technological Appropriateness

The development literature as well as the literature on disasters is full of references to how important cultural appropriateness is to the process of planned intervention. This literature emphasizes the principle that intervention programs should take the local culture into account when planning and executing interventions in order to avoid cultural disruption brought about by introducing foreign patterns that do not fit into the local context (Manners 1968). The tastes and preferences, as well as forms of social organization expressed in local institutions, according to this view, should be respected and protected. If this injunction is ignored it is believed that sociocultural disorganization will emerge within the system and the level of adjustment between the community being assisted and its environment will be lowered or the level of life satisfaction of the people being affected by the intervention will be reduced.

The inappropriate diffusion of foreign patterns into the local culture of a developing country by outsiders from the so-called developed world is regarded by many as cultural imperialism (Carmack 1978). Furthermore, it is sometimes observed that such diffusion frequently transmits patterns that are known to have been not all that successful in the developed world from which they came. They therefore perpetuate mistakes made in the development process elsewhere.

In the Guatemalan earthquake, the charge was often heard that foreigners from the developed world who came to Guatemalan villages to help in reconstruction left them looking like villages in the countries from which the foreigners came rather than like they were before the earthquake. Thus it was said that one could see a Swiss village here, a German one there, and an American one in the next town because those who came to help transferred their own cultures and did not take the housing culture of the communities they were assisting sufficiently into account. While this charge is exaggerated, it puts into capsule form the concern of many field workers over cultural appropriateness. The houses built in reconstruction, according to this view, should look like Guatemalan houses, and the reconstructed village should look, and for that matter, function like a Guatemalan village after reconstruction is complete.

Along with the concern over cultural appropriateness goes a concern with what is called in the literature "appropriate technology." In the case of technology the concern is not so much for a match between aid and value preferences and tastes, or with conformity to local standards, as it is with fitting the technology which is introduced into the local environmental resource base and into the larger technological system present within the community (Baker 1976, Goulet 1975). A technology is judged to be appropriate when it can be readily supported by the surrounding technological base of the society with only minor adjustments, and when the economic and natural resources are also present to support it. There is one more condition used to judge technological

appropriateness. The technology must not do damage to the ecosystem or bring about disruptive changes in the social organization of the society by producing technological unemployment in a system unprepared to offer other sources of income.

In the case of technological appropriateness during reconstruction, the issue in Guatemala was often expressed in concerns over methods of house construction and housing form. For example, some agencies built housing using concrete blocks with steel reinforcement employing mass production techniques. Critics charged that such technology was inappropriate because it required financial inputs that could not be sustained by the economy of rural villages and did not fit the natural resource base. Instead, critics felt that modified forms of adobe construction which would be safe in an earthquake were more appropriate both technologically and culturally.

These issues of appropriateness are concerned, of course, with fitting aid into its sociocultural context and, if carried to their ultimate extreme as criteria to guide the aid process, lead to a conservative position with respect to change and development. If all aid were totally in conformity with existing culture and fitted perfectly into the predisaster technological context, then the process of reconstruction would leave the disaster stricken community exactly as it was before the disaster, without either significant change or development. As a matter of fact, this is what some believe should be the goal of disaster assistance (Carmack 1978).

Both cultural and technological appropriateness as goals come

squarely up against other goals that enter into the relief and reconstruction as well as the development process. For example, the desire to prevent future disasters by improving the aseismicity of housing, obviously calls for a change in housing patterns and this demands a change in housing technology. The ultimate question is how far should such changes go, and how close can they conform to the ideals of cultural and technological appropriateness and still attain improvement in aseismicity, or for that matter, along other dimensions such as developmental improvements in sanitation and health conditions.

As shall be seen in later discussions, the idea of cultural appropriateness is not quite that easy to come to grips with. It requires the observer to be able to separate what is cultural from what is economic and political in making judgements concerning appropriateness. The form that a person's house takes, or that virtually all of the housing in a village takes for that matter, may be more a question of the economics of poverty than cultural preference. Besides this, cultures always contain hierarchies of values, which are at times inconsistent. A person may like the looks of an adobe house, and prefer the way it responds to the climate, but at the same time place greater importance on personal safety in an earthquake. What is therefore culturally and technologically appropriate becomes a complex rather than a simple matter.

Dependency, Paternalism and Rising Expectations as Issues

The dependency issue also looms large in the literature on development and is of considerable concern to those engaged in disaster

relief (Lappe and Collins 1977, Franke and Chasin 1980). Dependency refers to a complex set of phenomena involved in the social organization of a society and in its relationship to other societies in the world system. As a concept it is difficult to separate from the notion of the "division of labor" on the one hand, and from what can be called paternalism in the relationship between individuals and their government or their employers on the other. In the relationship between nations, dependency is often referred to as colonialism.

One thing that makes an understanding of dependency difficult is the fact that all differentiated societies which employ specialization in the production of goods and services contain a division of labor which makes each individual dependent on others for the things he or she needs to maintain his or her life style. This division of labor also makes one segment of a social system dependent on other segments of the same system for inputs. This sort of situation is what is called structural "interdependence" and is the inevitable consequence of social differentiation (Wallerstein 1976). A similar differentiation at the level of the world system exists among societies that exchange inputs and outputs with each other in a global system of differentiation and specialization brought about by historical processes and by the unequal distribution of resources around the world.

Interdependence implies some form of more or less equitable exchange of inputs and outputs among the units of a larger system. Dependency, however, refers to a pattern of unequal exchange between trading partners such that one dominates the other and in effect dictates the terms of the exchange (Cardoso and Faletto 1967, Frank 1979). At the level of nations,

dependency refers to one country depending on another as a source of goods and services which can not be produced domestically when the dependent nation gradually loses more resources to its exchange partner than it receives (Dos Santos 1970). Or to put it another way, it refers to situations in which an unfavorable balance of payments emerges because products produced using higher levels of technology are purchased using raw materials or products produced using low technology as the basis for payment. Guatemala is said to be dependent on the United States and other developed countries because it purchases expensive industrial products such as steel, automobiles, television sets, refrigerators, machinery, and processed food products from it but sells back coffee, sugar, bananas, cotton and beef. The Guatemalan products sold to acquire foreign exchange are produced using very low paid labor which in effect subsidizes both the consumers of these products in the United States and the wealthy in Guatemala who control export agriculture and consume the imported industrial products bought abroad. It is believed by many who write on development that the dependency of a country like Guatemala on foreign industrial imports obtained in exchange for agricultural products and raw materials is at the root of the rural poverty which prevails in the country (Friere 1970, Furtado 1972, Frank 1979). If the disaster relief and reconstruction process increases dependency on foreign industrial products, for example to produce houses, and to maintain community services, it may lead in the future to greater levels of poverty in rural areas.

But dependency also can be interpreted to mean that a person or group of persons lack the skills and the political or economic power to

meet their own needs and therefore must depend upon others to look after their welfare. It is in this context that the term "paternalism" arises. In the case of disaster relief some argue that if the government of the stricken country or agencies from outside the country take it upon themselves to supply aid without requiring a contribution of some sort from the victim, then victims will become dependent on the aid source and will not be able or willing in the future to contribute to their own welfare (Furtado 1972). This is of course the same as saying that charity breeds dependency, and robs the recipient of his or her independence, at the same time failing to take advantage of the recipients' own resources to help solve their own problems.

In the development literature it is argued that if food programs are established to feed people, they will cease feeding themselves and become dependent on food programs (Lappe and Collins 1977). This means that such programs will perpetuate themselves but at the cost of increasing dependency. It is also said that if, after a disaster, refugee style housing centers are built and victims are moved out of the rubble into them, and these centers supply food, water, medical attention and other needs for the victims, they will become dependent on these services and will not be active in helping themselves. As a consequence, recovery may be delayed, or for some who become perpetual wards of the state, never arrive.

The dependency-paternalism issue enters strongly in the design of disaster relief and reconstruction programs and is at the base of debates over the conditions under which aid should be offered (Lappe and

Collins 1977). Should aid be given away free or should it require a financial or labor contribution from the victims? Should it be distributed, whatever the basis, only according to need or should the amount of loss suffered in the disaster be considered also? How should distribution programs be managed? Should they emphasize local participation in planning and execution, even at the cost of delays and inefficiency or should they emphasize quick efficient response by well organized external agencies?

Finally, the issue of "rising expectations" may loom large in both development and disaster relief operations. This term refers to the tendency of people who live in underdeveloped countries, largely in a state of poverty and therefore have very little, to grasp at any straw that promises to better their situation. Anything which promises improvement tends to raise their level of expectations even when the promises made by development or relief agencies are beyond the capacity of those agencies to respond.

Outsiders who go into communities in underdeveloped countries are often optimistic about what they can accomplish, and about the ease with which things can be done. They are often so eager to establish themselves, and at the same time so sympathetic with the people they serve that they make commitments which are beyond their capacity to deliver. The tragedy is that people who are desperate are eager to believe that things can improve and their "level of expectations" often jumps way ahead of what can be attained. This of course leads to frustration and discouragement, but also to increased future demand

for assistance and often to hostility when it is not delivered.

If disaster programs, which are always temporary and relatively short term because they are geared to a disaster situation, make sudden improvements, in housing for example, thus demonstrating what can be done about housing, they are likely to leave behind a higher level of expectation for future public programs than existed before the disaster. If the programs executed require resources beyond what are likely to be available in the future, when outside disaster related aid ceases to pour in, the level of expectation in housing will have risen beyond the capacity of the domestic economy to support it. Nevertheless the demand for services will linger and the public sector of the country involved in housing will have difficulty satisfying the demands of its citizens. This may mean political trouble.

The Issue of Victim Participation Versus Disaster Professionalism

Both the cultural and technological appropriateness issue, and the issue of dependency are closely tied to the question of how the relief and reconstruction process should be managed, and who should participate in it. Also related is the problem of differentiating and integrating emergency assistance and long range reconstruction.

The entire question of how to organize the relief and reconstruction effort revolves around the fact that several kinds of organizations with quite different missions and philosophies as well as funding sources operate both separately and in relationship to one another in complex disaster situations. Because of the variety of actors in the disaster

relief and reconstruction drama, there is never a single dominant philosophy of aid which guides the disaster oriented social system. Furthermore, there is rarely a single authority center in effective control of what is going on in the field, even though attempts may be made to assert such control by relevant governmental authorities.

Broadly speaking there are at least seven different kinds of organizations, institutions or groups that enter into the complex process set in motion by large scale disasters: (1) regular governmental institutions from the victim country that have normal non-disaster missions, (2) foreign governments and their field representatives, (3) disaster relief oriented organizations from the victim country and abroad, (4) development agencies from the victim society and abroad, including PVOs, (5) religious groups, both domestic and foreign, (6) private enterprises, both domestic and foreign, and (7) opportunists, adventurers, and "individual volunteers."

Each of these groups has its own agenda and usually its own standard operating procedures for carrying out that agenda. Each also has its sponsoring constituency to which it is responsible, and usually its own permanent personnel whose careers are tied to particular jobs, intervention philosophies, and operating procedures. Finally, each has its own clientele or type of clientele to whom it normally delivers particular kinds of services.

If all of these types of organizations were examined carefully, they could be classified along a continuum between those who emphasize the execution of programs by a bureaucratically managed professional

staff who perform services or execute programs for a clientele (without much client participation except as a recipient of goods or services), and those who emphasize grass roots participation in program design, management and execution.

Generally speaking, those organizations whose role in disasters is highly tied to the delivery of emergency services fall at the bureaucratically managed end of the continuum and those whose primary role before becoming involved in disaster was development tend to fall more towards the grass roots participation end of the scale. This is quite understandable when one considers the fact that many emergency activities can hardly wait to organize grass roots participation before they meet urgent, life threatening needs. On the other hand, development activities have long range time perspectives and can well afford to proceed with all deliberate speed.

Problems arise in disaster situations, however, at the interface between emergency and reconstruction activities. These two processes are not distinct in the real world, and activities carried on by both emergency and reconstruction-development agencies are often mixed with respect to which process they relate to. As a consequence, a debate arises over how certain types of aid should be managed and delivered, not to mention the fact that there are arguments over whether it should be delivered at all. Temporary housing and emergency food are examples of types of aid where emergency relief and traditional development agencies are likely to disagree. The disagreement stems directly from the different views held by the two types of organizations concerning

the dependency issue, and the issues of cultural and technological appropriateness. To emergency agencies, the appropriate aid is that which saves the most lives, and mitigates the most suffering, or which restores normal services in the shortest amount of time. Questions of cultural and technological appropriateness, and of dependency seem irrelevant while a life threatening emergency is in progress. Once the initial emergency period is over, however, and activities turn to such questions as housing and the restoration of urban services and public institutions, these questions crop up as relevant issues. As emergency organizations begin to deal with these issues they are likely to come up against development agencies that begin to question their actions.

There are further divisions within the agency community over who should manage the aid process, and how it should be managed. For example, the governmental bureaucracy of the affected country, and the local government in individual communities are likely to see themselves as the appropriate managers, especially of reconstruction programs. But voluntary agencies with either emergency relief roles, or reconstruction-development roles to play are likely to seek autonomy at both the national and local community levels.

There is the additional fact that foreign development agencies in a country like Guatemala where there is an elite group in power, and a large mass of poor peasants, are likely to see the peasants as their clientele and not the government. Furthermore, there is the definite tendency of such agencies to distrust the authorities, who are blamed in part for the plight of the poor. Foreign development agencies

therefore tend to want to work directly with the poor without having their aid pass through the hands of the political power structure. The reasoning is that if the power structure, or the government bureaucracy controls aid, it will not reach the people who need it, but will benefit the dominant group in the society. When such organizations refer to local management and participation they mean participation by ordinary citizens and not by local governmental officials. When the governmental apparatus of the stricken country refers to such matters, however, it means the normal machinery of government.

In the Guatemalan case there was an awareness on the part of voluntary agency and foreign governmental personnel, as well as officials of the Guatemalan government, of what had transpired in Nicaragua only a few years before. There the Somoza government had exercised centralized control of the aid flowing into the country, and charges of corruption and mismanagement were well known. Everyone, but especially outside aid sources, was determined to avoid a repetition of this situation. Therefore foreign agencies were even more than normally concerned with maintaining control over their own programs and with working more directly with victims rather than funneling aid through local authorities.

As shall be seen in a later chapter, the Guatemalan government, through its Emergency and Reconstruction Committee, was also sensitive to the Nicaraguan situation and to the need to avoid undue centralization. It therefore granted more than usual autonomy to outside agencies, and emphasized grass roots participation. In interpreting what happened in Guatemala between 1976 and 1980, the fact that the shadow of events

in Nicaragua hung over the scene can not be over-emphasized.

Even though this was the case, considerable variation among agencies occurred in how much emphasis was placed on local participation. There are important questions still to be answered concerning the long-range effects of such participation on the social change and development process. For example, the question arises, "If local participation means skirting the local power structure, and developing new leadership, what implications does this have for the long-range stability of the political organization of the society?" Also, there is the question of whether aid conducted and managed at the "grass roots" level might change the stratification system of the community by favoring the lower stratum at the cost of the higher one. This of course raises the ultimate question of whether development can take place in Central America without such a change.

It is apparent from this discussion that the manner in which aid is managed in a massive disaster situation has implications for structural changes in the society being assisted. These structural implications are both political and economic in nature and are directly connected to the development process. They therefore must be monitored in any study of disaster reconstruction in the developing world.

Summary

The theoretical orientation discussed above and the practical issues drawn from it, will be used as a guide to conducting the analysis of data gathered over a five year period on the Guatemalan earthquake and the reconstruction-development process that followed it. The general

theoretical orientation can be briefly stated as follows:

1. A disaster is a result of interaction between a socio-cultural system which has particular social, cultural, political, economic and technological characteristics and a physical agent, in this case a 7.5 Richter Scale earthquake.
2. The resultant damage and loss suffered and the degree of disruption of the sociocultural system is a product of this interaction.
3. The disaster focused social system which forms out of those who offer aid has its own organizational characteristics as a system and this new emergency-reconstruction system interacts with the now dis-organized victim community or society, and produces changes in it, hopefully in the direction of mitigating and ameliorating the effects of the disaster.
4. The effects of the interaction between the victim community and the disaster focused social system will produce changes in the victim sociocultural system. These changes may be developmental and lead to higher levels of adaptation of the victim community to its human population and to its natural and geopolitical environment or they may be in the opposite direction.
5. To decide upon which direction the society is moving in and also to understand the dynamics of the change process, it is necessary to attend to certain broad issues raised by scholars who study development and by those who shape the disaster relief process. The most important among these issues are: (a) the cultural and technological appropriateness of aid and of aid delivery systems, (b) the issues of dependency, paternalism, and rising expectations, (c) the question of centralized professional management of aid processes versus decentralized, grass roots participation and management.

These general issues imply a whole series of particular questions concerning the type of aid offered and the way it is organized and managed which involve choices made by agencies in shaping their programs.

The objective of this monograph is to examine concrete aspects of the reconstruction process in Guatemala such as emergency shelter, housing,

level of living or community level services to evaluate the kinds of changes produced by different program types in terms of these issues. It will not be possible to measure cultural or technological appropriateness, or for that matter, dependency directly. Instead, indirect measures must be employed and judgements made concerning what these indirect measures mean in terms of these dimensions of change. In the long run, the question of whether development has taken place must be answered by each reader in terms of how he or she interprets the findings reported in this monograph.

References

- Baker, Randall
 1976 Innovation Technology Transfer and Nomadic Pastoral Societies. in: M. H. Glantz (ed.), The Politics of Natural Disaster. New York: Praeger Publishers.
- Bates, Frederick L.; C. W. Fogelman; V. J. Parenton; R. H. Pittman; and
 1963 G. S. Tracy
The Social and Psychological Consequences of a Natural Disaster. Disaster Study Number 18. Washington, D. C.: National Academy of Sciences.
- Berg, Elliot
 1975 The Recent Economic Evolution of the Sahel. Report to USAID. Mimeographed. Center for Research on Economic Development, University of Michigan, Ann Arbor, Michigan, (June).
- Berger, Peter L.
 1974 Pyramids of Sacrifice. Garden City, N.Y.: Anchor Press.
- Cardoso, Fernando H. and Enzo Faletto.
 1967 Dependencia y Desarrallo en América Latina. Santiago: ILPES.
- Carmack, Robert M.
 1978 Development and Social Effects of the Guatemalan Earthquake. in: Vol. I, Proceedings of International Symposium on the Feb. 4, 1976 Guatemalan Earthquake and the Reconstruction Process.
- Cleaver, Harry M. Jr.
 1979 The Contradictions of the Green Revolution. in: C. K. Wilbur (ed.), The Political Economy of Development and Underdevelopment. New York: Random House.
- Dos Santos, Theotonio
 1970 The Structure of Dependence. American Economic Review. LX, 2: 231-236.
- El Khawas, Mohammed
 1976 A Reassessment of International Relief Programs. in: M. H. Glantz (ed.), The Politics of Natural Disaster. New York: Praeger Publishers.
- Frank, Andre Gunder
 1979 The Development of Underdevelopment. in: C. K. Wilbur (ed.), The Political Economy of Development and Underdevelopment. New York: Random House.

- Franke, Richard W. and Barbara H. Chasin
1980 Seeds of Famine. Montclair, N.J.: Allenheld, Osmun & Co. Publishers, Inc.
- Friere, Paulo
1970 Pedagogy of the Oppressed. New York: Herder and Herder.
- Fritz, C. E.
1961 Disaster. in: R. K. Merton and R. A. Nisbet (eds.), Contemporary Social Problems. New York: Harcourt.
- Furtado, Celso
1972 The Concept of External Dependence in the Study of Underdevelopment. Paper presented to the Union for Racial Political Economics, Washington, D. C. (November 10, 1972).
- Glantz, Michael H.
1976 Nine Fallacies of Natural Disaster: The Case of the Sahel. in: Glantz (ed.), The Politics of Natural Disaster. New York: Praeger Publishers.
- Goulet, Denis
1975 The Paradox of Technology Transfer. The Bulletin of the Atomic Scientists. XXXI (June): 39-46.
1979 "Development"...or Liberation? in: C. K. Wilbur (ed.), The Political Economy of Development and Underdevelopment. New York: Random House.
- Henriot, Peter J.
1979 Development Alternatives: Problems, Strategies, Values. in: C. K. Wilbur (ed.), The Political Economy of Development and Underdevelopment. New York: Random House.
- Hill, Reuben and Donald A. Hanson
1962 Families in Disaster. in: George W. Baker and Dwight W. Chapman (eds.), Man and Society in Disaster. New York: Basic Books, Inc.
- Lappe, Frances Moore and Joseph Collins
1977 Food First. Boston: Houghton Mifflin Co.
- Manners, R. A.
1968 Functionalism, Realpolitik, and Anthropology in Underdeveloped Areas. in: Manners and Kaplan (eds.), Theory in Anthropology. Chicago: Aldine Publishers.
- Prince, S. H.
1925 Catastrophe and Social Change. New York: Columbia University Press.

Wallerstein, Immanuel

1976 The Modern World-System. New York: Academic Press.

Wiseberg, Laurie

1976 An International Perspective on the African Famines. in:
M. H. Glantz (ed.), The Politics of Natural Disaster.
New York: Praeger Publishers.

Chapter 2

Research Design and Field Work Methodology

W. Timothy Farrell and Frederick L. Bates

Introduction

Research designed to evaluate human intervention programs or to examine hypotheses concerning social change and development requires a carefully thought out and executed plan. This is especially true if hypotheses concerning the roles played by various causal variables are going to be tested (Rossi and Freeman 1982:62). The basic methodological problem confronting such research is to devise a method whereby the changes observed over time can be attributed to the human intervention program rather than to other causes, particularly those which produce "normal" change trends in the system being studied (Rossi and Freeman 1982:38).

In any society or community, whether impacted by a disaster or not, change is constantly underway. In developing societies in particular, modernization trends are taking place and the societies are moving in one direction or another with respect to development objectives. Furthermore, in a country like Guatemala, development programs may be in the process of execution when the country is struck by a disaster and then affected by disaster relief and reconstruction programs. If the effects of disaster related programs are to be assessed, it is necessary to employ a research design which can separate the trends produced by on-going

change processes and pre-disaster intervention programs from those peculiarly associated with the disaster and its associated post-disaster intervention programs. If this is not done, then it will be impossible to tell which of the changes observed in the post-disaster period are truly disaster related and which are merely continuations of on-going processes (Campbell and Stanley 1966:13).

Because of these problems, research on social change and development associated with disasters which hopes to evaluate the effects of intervention strategies calls for an experimental design. (For description see Campbell and Stanley 1966:13, and Weiss 1972:60.) Such a design employs a control and experimental group along with before and after measures on relevant variables and characteristics. It furthermore assigns subjects (individuals or groups) to the experimental or control group randomly so that they represent unbiased samples of the same population. The experimental treatment or intervention is then introduced (in this case the earthquake and the disaster mitigation inputs) only into the experimental group, maintaining isolation of the control group from these interventions (Campbell and Stanley 1966, Weiss 1972).

If this design is adhered to, then the investigator can reasonably attribute changes in the experimental group beyond those observed in the control group to the intervention. If, however, any deviation occurs from this design, problems arise in interpreting results since there are a number of possible competing explanations for what is observed.

In the study of post-disaster reconstruction many of the conditions listed above are impossible to attain and others can only be approximated.

As a consequence, the best design which can be used is one which is only quasi-experimental since it only approximates the ideal experiment (Campbell and Stanley 1966:34, Weiss 1972:67, Rossi and Freeman 1982:217). In particular, it is impossible to achieve randomization in the assignment of units to the control and experimental group. Potential membership in these groups by individuals, households, or communities is determined by the disaster event and where it strikes. Those people and those households and communities stricken by the disaster become a pool from which an experimental group may be chosen. They are potential experimental group subjects because they experience the "experimental treatment," in this case the earthquake, and post-disaster relief and reconstruction inputs. Those not directly affected by either the earthquake or relief and reconstruction programs become a potential control or comparison group (Weiss 1972:69, Rossi and Freeman 1982:219).

For two particular reasons, however, this potential comparison group can only act as a "weak control" in experiment terms. First, potential membership is determined by the non-random effect of the earthquake and disaster mitigation programs. This means that the two sectors of the same society from which the control and experimental group are drawn may be quite different from each other to begin with. One might be changing at a faster rate than the other, or one may start out measuring higher or lower on some critical attribute, for example economic resources, than the other. As a consequence of such inequalities it will be difficult to separate differences in changes produced by the disaster and recovery process from those produced by inequalities between the two groups. The

experimental group (disaster victims) may change faster than the control group (non-victims) because they were more receptive to change to begin with and were already changing at a more rapid rate and not because of disaster related effects.

There is a second reason that "control groups" in disaster research designs executed in small developing countries like Guatemala are at best "loose controls." The affected area from which the experimental group is selected, and the unaffected area from which the control group is chosen are close to each other and effects of the earthquake may "spill over" and affect the control group. Thus the experimental "treatment" is not kept exclusively in the experimental group and because of this, part of the change in the control group must be attributed to the disaster. This means that it will take a larger change in the experimental group produced by the earthquake and reconstruction inputs to register as significant in statistical terms. As a consequence, disaster related change may actually occur and appear to be attributable to non-disaster change processes.

Because of these two difficulties, the best that can be achieved in most disaster research situations is a quasi-experimental design which uses a "weak control group" for purposes of comparison with an experimental group. Such a design was chosen for this study, with full knowledge of its limitations, since such a design is still superior to one which neglects any comparison with groups outside the immediate disaster area (Campbell and Stanley 1966:47).

There is still another reason that an ideal experimental design can

not usually be achieved in a disaster study. Such a design requires longitudinal data which measures key variables in both the experimental and control groups both before and after the experimental treatment, in this case the disaster and disaster related mitigation programs. Since disasters are seldom predicted in advance and since research funds are almost never available to gather pre-disaster data on communities or societies likely to be struck, pre-disaster measures of key variables with respect to the exact units which are later studied are not available. Studies begun after impact must therefore depend upon public data sources which never quite fit the needs of the researcher, or upon retrospective data compiled from the memories of victims and public officials. Such data introduce a source of error into the research process which is of unknown proportions and is difficult to overcome (Bates et al 1963:174-177).

Since data on the pre-disaster situation of both the control and experimental groups are collected using this method however, it is unlikely to produce different results with the two comparison groups and differences observed over time between them can safely rule out this factor as a source. If retrospective data introduces systematic errors it should have the effect of exaggerating or minimizing change in both groups rather than differentiating between them.

Some of the data obtained from memories of respondents can be checked against public records and published statistics, most of the time at the aggregate level, and judgements can be made as to whether they exaggerate or underestimate the true pre-disaster situation. Nevertheless, such

data introduce a potential source of error into the research process.

In this study such data were obtained through interviews with household heads and community leaders to establish the physical and economic resources of households and communities immediately before the disaster. These data pertain to such subjects as household composition, characteristics of the house itself and of the physical facilities it offered, the occupations and incomes of family members, their land ownership or land tenure situation, the production of agricultural products in the year preceding the earthquake, and so forth. These retrospective measures represent benchmarks against which change is measured subsequent to the earthquake. Also subject to retrospective methods were data collected on disaster relief and reconstruction inputs for the first one and a half to two years following the disaster. Beyond this time, data were collected contemporaneously on three time periods. It is these contemporaneous data that are compared to retrospective data to make change measures in this study.

The research design therefore can be termed "quasi-experimental" and "longitudinal" in that it employs an experimental and "weak control" group upon which measures are taken longitudinally, beginning with retrospective data and proceeding through three waves of data collection on current or contemporaneous situations. The broad outlines are given in Table 2-1.

Because this research is focused on the effects of disasters on social change and development and at the same time on how the characteristics of the sociocultural system affected by disaster respond to

Table 2-1
Characteristics of the Research Design

Study Group	Type of Data and Time Period				
	Retrospective Data		Contemporaneous Data		
	Pre-earthquake Time 1	Disaster Impact Time 2	2 yrs. After Impact Time 3	3 yrs. After Impact Time 4	4 yrs. After Impact Time 5
Experimental Group (Households in communi- ties heavily damaged by the earth- quake)	e^{X_1} *	e^{X_2}	e^{X_3}	e^{X_4}	e^{X_5}
Control Group (Households in communi- ties lightly or unaffected by the earth- quake)	c^{X_1}	c^{X_2}	c^{X_3}	c^{X_4}	c^{X_5}

* e^{X_1} - measure on a variable such as the value of the house occupied by a victim in the experimental group at Time 1, just before the earthquake. Numerical subscripts indicate same measure at succeeding time periods.

various forms of intervention, it was necessary to introduce additional sampling criteria to those implied by the selection of a control and experimental group. In particular, there were three dimensions of stratification introduced into the sample design. First, because of interest in the effects of cultural differences on disaster response, and because of interest in the cultural appropriateness issues and issues related

to the equity of distribution of aid, the sample was divided into an Indian and a Ladino sample. Guatemala is about evenly divided into these two ethnic groups with the Ladino group being in a dominant political and economic position. Both the experimental and control groups were therefore sub-divided into communities which were predominantly Indian and those which were predominantly Ladino.

Since these two populations are unevenly distributed geographically, with most predominantly Indian communities being primarily in the highlands, and most predominantly Ladino communities being concentrated in the East, an East-Highlands stratification was introduced into the sample along with the ethnic differences.

Finally, there was interest in looking at how community size, complexity and isolation affected the reconstruction development process since social organizational factors vary along these lines, and program design and delivery problems also are affected by them. It was decided therefore to stratify the sample according to the political status of the community in the Guatemalan governmental administrative system.

Guatemala is divided into departments, each of which has a departmental capital. These are next divided into municipios which are further subdivided into smaller places called aldeas. There is an even smaller unit called a casaria. Departments are like states in the United States, and municipios are like counties. Each has a central administrative center called a cabecera. It was this central unit which was selected for study. The control and experimental groups were then divided into department capitals, municipios and aldeas. Particular

units for inclusion in the sample were selected on a basis to be discussed later under the execution of a sampling plan.

The design, as discussed so far, excludes Guatemala City. This very large urban center, which serves as the capital of the country, was also struck by the earthquake and therefore fell naturally within the experimental group. However, there is no other city in the country which can be compared to it. It was therefore impossible to select a control group for comparison. Furthermore, the city had close to a million residents at the time of the earthquake and funds were not available to draw a truly representative random sample of the entire city, and at the same time collect data on towns and villages in the countryside. Since communities outside the city represent a variety of sociocultural organizational patterns, and since reconstruction programs of particular types were associated with particular communities, thus offering an opportunity for many cross-community, cross-program comparisons, it was decided to put most of the project's resources into data collection outside the city. There was the additional fact that development programs are concentrated there and the chance of observing the impact of disaster on development would be maximized by this procedure, given research funding limitations.

There was, however, a need to monitor a number of things going on in the city. In particular, reconstruction programs had been undertaken there to house disaster victims in newly formed neighborhoods. There were four types of situations known to exist. First, squatters settlements had grown up in various parts of the city and it was believed

these settlements were comprised mainly of disaster victims, many of whom had migrated to the city following the earthquake. Information was desired on the origin of these settlements and on their evolution as "communities" following the earthquake.

Secondly, the Guatemalan government had built refugee style housing settlements to take care of the large number of people who had moved into the streets and parks of the city right after the earthquake. Again, information was desired on the origin of these people, and on their eventual fate as the reconstruction process progressed.

A third type of urban housing area which grew up after the earthquake consisted of permanent houses built by means of agency programs to house disaster victims. This sort of housing development was believed to represent the final stage in the resettlement of squatters and victims who were housed in government disaster refugee centers. Such areas usually consisted of several hundred newly built detached houses and newly constructed community facilities and services and presented an opportunity to study the formation of a new urban neighborhood-community stemming from the disaster.

A final stype of unit was like the one just discussed, but was built to house people who were being resettled from a rural community which had been so badly damaged that it could not be fully rebuilt. This community represented one of the rare cases in which Indians were being resettled from rural areas into the city and presented an opportunity to observe the change processes associated with such a movement.

The city sample for this study therefore contains four urban neighborhoods of the types described above: (1) a squatters settlement,

(2) a refugee temporary housing project, (3) a newly built agency housing development for urban disaster victims, and (4) a newly built agency housing development for the resettlement of Indians from a heavily damaged rural community. The plan was to use these units as comparison groups for each other since no effective control group could be found for any of them.

The final sample design for this research at the level of the community is given in Table 2-2.

Table 2-2

Community Sample Design

<u>Type of Community**</u>	<u>Experimental</u>		<u>Control</u>	
	<u>Indian</u>	<u>Ladino</u>	<u>Indian</u>	<u>Ladino</u>
City	1*	3	0	0
Department Capital	1	1	1	1
Municipio	3	2	1	1
Aldea	4	4	2	1
TOTAL	9	10	4	3

* The community from which the Indians in the city came was also included in the sample. It was a municipio on the outskirts of the city and is included as an Indian municipio in this table.

**The East-Highlands division of the sample consists of Experimental, 6 East, 9 Highland; Control, 3 East, 4 Highland.

As can be seen from this table, the control and experimental groups are not balanced in the number of communities selected for study. It was decided because of the weak nature of the control to select only enough communities to provide a control for each of the classes of units in the experimental group so that comparisons could be made between department capitals, or municipios and aldeas, in both the Indian and Ladino categories when necessary. This permitted a larger sampling of the disaster area than would have been the case if a balanced sample of each had been used. Excluding the city and the one rural municipio associated with the resettlement of Indians, there are twice as many experimental group communities as control group ones. For a listing of the exact communities used in the sample and their classification according to sampling plan, see Table 2-3.

Sampling

Because the communities chosen for investigation were selected by a series of criteria other than strict probability sampling, e.g. design requirements, availability of pre-earthquake data, researchers' familiarity with the region, etc., it was of paramount importance that the sampling design used to select households for interview insure true representativeness insofar as possible.

Obviously one major problem to be overcome was the disparity in the size and kinds of units to be studied. How does one compare, for example, Chimaltenango, a large department capital, with Pacoc/San Marcos, a small divided aldea? Are the aldeas chosen truly representative

Table 2-3

Communities Selected for the Research

<u>Indian</u> ¹	
<u>Experimentals</u>	<u>Loose Controls</u>
Chimaltenango (Dept. Capital)	Sololá (Dept. Capital)
Patzún (Municipio)	San Lucas Tolimán (Municipio)
San Martin Jilotepeque (Municipio)	Cerro de Oro (Aldea)
Las Lomas (Aldea)	San Marcos La Laguna (Aldea)
San Marcos (de Puerto Rico) (Aldea)	
Pacoc (Aldea)	
Santa Maria Cauque (Aldea)	
Chinautla (Municipio)	
<u>Ladino</u> ¹	
El Progreso (Dept. Capital)	Cuilapa (Dept. Capital)
Sanarate (Municipio)	Barberena (Municipio)
Conacaste (Aldea)	El Junquillo (Aldea)
Santo Domingo Los Ocotes (Aldea)	
Espiritu Santo (Aldea)	
San Juan (Aldea)	
Zaragoza ² (Municipio)	
<u>Guatemala City</u>	
Carolingia (Agency Housing Development)	
Roosevelt (Guatemalan Government Refugee Housing)	
4 de Febrero (Squatters Settlement)	
Nueva Chinautla (Agency Housing for Indians from Chinautla)	

of other aldeas supported by the same municipio? Does the weight given to the aldeas studied over or under-represent population under investigation? These and similar questions were critically asked throughout the process of elaborating the final sampling design. Ultimately it was decided that a modified multi-stage cluster design be used.

A cluster sampling design was chosen for use in this research and justified on the basis of several factors, not the least of which was cost. In the initial post-earthquake phases, not only was it impossible to "list" people, or families, but it was not even clear as to what was a house or a household. It was known that there were people "out-there," but there was no way of knowing how they were grouped and organized. In addition, individuals and families tended to be quite fluid during the early reconstruction period, living with friends and relatives, or alternatively accepting friends and relatives into their homes or temporary shelters. Thus, it was quite impossible to compile a family or household list or directory from which to draw a sample. In fact, that became a major section of the interview schedule itself.

A second factor in choosing a cluster design involved some well grounded assumptions about the areas and communities selected. Most of the communities were previously known to someone on the research team. Excluding Guatemala City, someone among the researchers had lived or worked in 18 of the 21 communities previously. Thus some assessment of the heterogeneity/homogeneity question could be made. As a consequence, two basic assumptions relative to the cluster design were formed.

1. Within smaller communities (rural) there is greater homogeneity than heterogeneity.

2. In larger communities, components (households) of a population are more or less systematically distributed (e.g. neighborhoods tend to share some common characteristics as manifested by the households that comprise them).

As a consequence, it was reasonable to assume that a few clusters chosen in small communities would be representative of the community as a whole. Similarly, it was assumed that given the method used to select clusters, representative data for large communities could be obtained. While it was recognized that cluster sampling may yield greater sampling errors than simple random samples of the same size (Blalock 1960:406). it was believed that the sample size and the longitudinal aspects of the research design would off-set this.

Mapping or "Listing"

A major concern in drawing the sample of households for this study was the fact that in the damaged towns, even the most current maps were rendered useless by the damage caused by the earthquake. Even in the control communities, the level of detail of the maps was inadequate for sampling purposes. As a consequence, all communities had to be re-mapped by the research team. In order to make maps sufficiently detailed for the purposes of this research it was necessary to visit every structure in all 26 sample units to verify if it was indeed a "house," and if it was in fact occupied. In addition, maps had to be highly accurate and clear so that the interviewers would be able to find the appropriate dwelling with a minimum of trouble; no mean task when confronted with labyrinthine paths and house sites obscured from view by corn fields and coffee trees. Accurate maps were also essential since three waves

of interviews were planned with the same households. It was essential that interviewers be able to find the same house over and over again.

It must be noted that the mapping task was as complicated as it was crucial. Aside from normal mapping procedures, inquiries had to be made regarding whether individual structures were occupied. Do people live here? How many families use the kitchen? Is there another structure used by this family? The details on the map also had to be sufficient to permit interviewers to readily locate the structure and family. Even with the detailed attention paid to mapping, there were still problems in identification of the correct household and their dwellings when interviewing took place.

Sampling Procedures

Ultimately it was decided to aim for a ten percent sample of households in the communities selected. In some communities this would vary because of the small size of the village. A community, say, of 150 houses would only yield a sample of 15 and would be too small for any sort of within-community analysis. In the larger towns of Chimaltenango and Patzun a ten percent sample would be uneconomical and would have perhaps over-represented the households in these communities with respect to the total sample.

Using the maps, the communities were divided into sectors of approximately 20-25 dwellings each. This rule was overridden if the number was reasonably close and if there were some natural division such as a street, that made a more logical boundary. Next, the sectors were numbered continuously (throughout all communities) from 001 to 795

(the last sector numbered). Numbering was done in a serpentine fashion, criss-crossing each community with a "string" of continuous sectors. Thus, for purposes of sampling, a conceptually contiguous population was employed.

To determine the sampling interval for the selection of the sectors ten percent of the total number of houses was divided by five since it had been arbitrarily decided to randomly sample five houses in each sector. This number was then divided into the total number of houses, yielding the number of sectors to be chosen. For example, if there were 1300 houses in a community, a ten percent sample would be 130 houses. Since five houses for each sector would be sampled, it was thus necessary to draw 26 sectors ($130 \div 5 = 26$). Then, the number of sectors, in this case 26, was divided into the total number of houses, giving a sampling interval number. Thus, once the houses were grouped by sector, the interval would define the sector. Table 2-4 illustrates this procedure. Once the sector was defined, the houses in the sector were numbered 01 - N and five houses were selected from a random numbers table.

Table 2-4 summarizes the basic sampling system. However, the details - specifically the intervals used - sometimes had to be modified to suit local conditions. For example, in El Progreso it was found that the original interval calculated would probably not yield a 10 percent sample as required, especially if there were a large quantity of refusals, "not homes," and so on. Therefore the interval was reduced to 50.89. Also, as noted before, a decision was made to sample about 25 households, minimum, in the small communities. Therefore the sampling fraction in

Table 2-4

Example of Interval Sampling (Santa Maria Cauque)

Sampling Interval: 50.89

<u>Sector (Cluster) No.</u>	<u>Number of Houses in Sector</u>	<u>Range</u>	<u>Selected Interval</u>
00443	24	01 - 24	01.02
00444	21	25 - 45	No
00445	21	46 - 67	51.91
00446	21	68 - 87	No
00447	19	88 - 106	102.80
00448	22	107 - 128	No
00449	21	129 - 149	No
00450	21	150 - 170	153.69
00451	20	171 - 190	No
00452	24	191 - 214	204.58
00453	20	215 - 234	No
00454	20	235 - 254	No
00455	20	255 - 274	255.47

those communities is always larger than the predetermined ten percent.

In addition, the communities of Pacoc, San Marcos Puerto Rico and Asentamiento Roosevelt were sampled somewhat differently. The interval system was the same (50.89), but because the houses in Roosevelt and San Marcos were "ordered," that is, formally arranged in neat rows, a simple system of sampling every sixth house was used. The interval system

indicated which block or row of house (i.e. cluster) would be sampled.

In Chinautla, the interval was reduced to about half, or 25.45. The rationale for this was the great number of empty houses due to migration and the high number of people employed daily in Guatemala City. Therefore, in order to guarantee an adequate sample, the lesser interval was chosen. As a consequence the original sampling fraction was 21 percent, or 72 houses. Even with this fraction, however only 45 interviews were ultimately obtained, yielding a final sampling fraction of 13 percent. Table 2-5 summarizes the sampling data from the first wave of interviews done in 1978.

As mentioned earlier in this section, both Patzun and Chimaltenango were problematic because of their size. Using the previously described system would have resulted in a sample of some 290 in Chimaltenango and 180 in Patzun, thus over-representing them for the purposes of this study. As a consequence, once these communities were mapped and sectors defined, about every third sector was eliminated, "reducing" the population (houses) by 24 percent in Chimaltenango and 32 percent in Patzun. The sampling system then proceeded as usual.

It will be noted that the city sampling unit of Asentamiento Roosevelt is seriously under-represented. This is due to a mapping error at the outset. The "Total Number of Houses" column represents the corrected total after the error was discovered, but the interviewing had been completed by then. Because of costs and time it was decided not to re-interview in that area.

Table 2-5

Sampling Data 1978 (EQ01)

Community	Total No. of Houses	Sampling Fraction Chosen	No.Houses Selected	No. Houses Interv.	% Int. Obtained	Sampling Fraction Obtained
Chimaltenango	2,022	.097	197	143	72.6	.071
Patzun	1,214	.099	120	107	89.2	.088
Zaragoza	871	.101	89	78	88.6	.089
San Martin Jil.	842	.095	80	66	82.5	.078
Las Lomas	65	.523	34	22	54.7	.338
San Marcos P.R.	88	.25	22	15	68.2	.170
Pacoc	48	.25	12	10	83.3	.208
Sta. Maria C.	294	.103	30	25	83.3	.085
El Progreso	967	.098	95	79	83.2	.082
Sanarate	1,278	.094	120	110	91.7	.086
Conacaste	198	.157	31	28	90.3	.141
San Juan	143	.189	27	23	85.2	.160
Sto. Domingo	203	.172	35	28	80.0	.138
Espiritu Santo	166	.169	28	25	89.3	.150
Cuilapa	877	.097	85	77	90.6	.087
Barberena	846	.095	80	50	62.5	.059
El Junquillo	131	.267	35	26	74.3	.198
Solola	1,061	.099	105	76	72.4	.071
San Lucas T.	738	.102	75	59	78.7	.079
San Marcos L.L.	171	.234	40	30	75.0	.175
Cerro de Oro	464	.097	45	31	68.9	.066
Carolingia	1,337	.09	120	101	84.2	.075
Roosevelt	1,870	.035	66	53	80.3	.028
4 Febrero	1,464	.099	145	117	80.7	.079
Chinautla	341	.211	72	45	62.5	.132
Nueva Chinautla	409	.159	65	49	75.4	.119
Average Sampling Fraction Obtained						.117

Health, Fertility and Nutrition Sub-Sample

A sub-sample of ten percent was selected upon which data related to health, fertility and nutrition were collected. This sample was obtained by drawing a random number from 1 to 10 to use as a starting point in each town. Then every tenth household was interviewed on these items.

Phase Two Sampling (EQ02)

In Phase II, the sampling universe was restricted to the damaged (experimental) communities only. It will be recalled that Phase II was designed to tap domains directly related to earthquake experience, thus the questions were irrelevant to members of the undamaged (control) communities.

Since a random sample as described above had already been drawn, and since households were being tracked over time, a simple convenience sample was drawn. A total of 256 households were interviewed. The communities were divided into "large" and "small" categories. In the "large" towns 32/33 households were selected and in the "small" communities the number varied from five to nine. Asentamiento Roosevelt and the Chinautlas were not sampled in Guatemala City since it was felt that 4 de Febrero was adequately representative of "squatter" settlements and Carolingia of "planned" settlements. Table 2-6 summarizes communities interviewed in Phase II.

Chimaltenango was not included in this wave of interviews. This was principally because of difficulty in obtaining interviews there due to a number of factors. Principally, many residents felt hostility towards agencies and outsiders in general because the town was used as a staging area and supply depot for many groups working in the area.

Table 2-6

Communities Interviewed in Phase II

Community	Number of Interviews
Sto. Domingo	8
Conacaste	8
Espiritu Santo	8
San Juan	8
Sanarate	33
Carolingia	32
4 de Febrero	33
San Martin Jil.	32
Las Lomas	9
Pacoc	6
Patzun	33
Sta. Maria Cauque	8
San Marcos P.R.	5
El Progreso	33

Residents felt that the aid was not being used to assist Chimaltenango which was severely damaged. In addition, because of its proximity to Guatemala City, numerous research groups, university students, and agency personnel, went to Chimaltenango to interview. By the time this study began over 50 waves of interviews had already taken place in this town and residents were hostile to interviewers. Because of these factors it was decided not to interview there in Phase II, recalling that it would be necessary to return for Phase III.

Criteria for inclusion in Phase II for individual households were:

1. Informant was a community leader either before or after the earthquake.
2. Informants were heterogeneous with respect to socioeconomic, ethnic and religious groups.
3. Informants were reasonably articulate (because of the nature of the Phase II schedules).

Thus informants (and alternates) were chosen before returning to the communities on the basis of the information obtained in the Phase I interviews.

Phase III (EQ03)

Phase III called for a 100 percent re-sampling of the Phase I population. No modifications were made in the sampling system. An attempt was made to revisit the communities in the same order as Phase I so that the time between interview waves was approximately the same for each community. Some minor changes were made because of weather problems (heavy rains make some towns nearly inaccessible at times), but generally the sequence was maintained.

Attrition was not as severe a problem as initially feared. Overall, the attrition rate from Phase I to Phase III was only 15 percent. Table 2-7 records the attrition rates for each community.

Summary

Briefly, then, the sampling system used was basically a cluster sample modified to meet local requirements. The Phase I sample was the basis for all subsequent samples and sub-samples. Convenience

Table 2-7

Attrition Rates Phase I - Phase III

<u>Community</u>	<u>Phase I</u>	<u>Phase III</u>	<u>Attrition Rate (%)</u>
Sto. Domingo	28	24	14.3
Conacaste	23	27	4.6
Espiritu Santo	25	22	12.0
El Junquillo	26	22	15.04
San Juan	23	21	8.7
Sanarate	110	92	16.04
Roosevelt	53	44	17.0
Carolingia	101	84	16.9
4 de Febrero	117	95	18.9
Nueva Chinautla	49	45	8.2
Chinautla	45	34	24.5
Chimaltenango	143	118	17.5
San Martin Jil.	66	59	10.7
Las Lomas	22	16	27.3
Pacoc	10	10	-0-
Patzun	107	89	16.9
Sta. Maria Cauque	25	22	12.0
San Marcos P.R.	15	8	46.7
Solola	75	61	18.7
San Lucas T.	59	56	5.1
Cerro de Oro	31	25	19.4
Zaragoza	78	66	15.4
Barberena	50	43	14.0
Cuilapa	77	12	6.5
El Progreso	79	68	14.0
San Lucas L.L.	30	27	10.0
TOTALS	1,472	1,250	15.1

sampling was used in Phase II. A total attrition rate of 15.1 percent occurred in the two years between Phase I and Phase III.

Field Operations

The best conceived research and sampling designs are only as good as they are well-executed. In this investigation every effort was made to adhere strictly to the design and to control the quality of data obtained. Administratively, the following organizational structure was used to manage field work:

1. Senior Resident Researcher - responsible for overall field management, budgets, administration and basic logistics.
2. Field Supervisor - responsible for day-to-day supervision of all field activities, quality control of data and field logistics.
3. Mapping Supervisor/Assistant Field Supervisor/Data Management and Control Supervisor - responsible at various phases during the operation for the above noted areas.
4. Interviewers (8) - responsible for interviewing, coding, cleaning and re-checking data.

In addition, the Co-Principal Investigators spent time in supervising and reviewing data as it was obtained. Further, especially during the training and early stages of data collection, data collection supervisors from INCAP's Division of Human Development were called on for assistance. These two individuals had over 21 years of data collection experience in Guatemala between them. As a consequence of their assistance, interviewers were well-trained.

Nevertheless, there are always problems in data collection, no matter what preliminary cautions are taken and the degree of supervision

exercised. This is all the more true when the interview teams may be in a community for as few as 3-4 days or up to three weeks to a month at a time.

The general field work procedure should be briefly outlined here, since it affects the quality of the data. The first step in field work was for the Field Director to make initial contact with formal and informal leaders in each community. The purpose of this contact was to explain the goals of the research, to discuss the interview schedule with them, and to obtain permission to collect the data. Usually a copy of the forms and the new map compiled by the research team was left with these authorities. Second, depending on the community, room and board facilities were found and contracted. This latter was often a problem in more isolated areas since adequate facilities were not readily available. It can not be stressed strongly enough that to maintain a "roving" field team over a three year period in a developing country which has recently experienced a disaster, living facilities and concomitant morale are of paramount importance. If local facilities were not available, then options had to be found and evaluated against the time and travel costs necessary to return the field team each day to Guatemala City, guaranteeing loss of interview time and delaying the general work plan.

Once these decisions concerning accommodations for the field team were taken, then "normal" interviewing would begin. Teams of two interviewers were assigned sectors or clusters. However, as noted above, even with the pains taken in mapping there were always some anomalies.

"Hidden houses" suddenly appeared; the function of the "house" structure would have changed from dwelling to store; families would have moved, etc. These problems had to be resolved by the Field Director, based on a general set of rules that had been previously developed. Once these factors were resolved, the normal problems of interviewing had to be coped with: locating the appropriate informant (i.e. usually the male or female head); defining who constituted the household being interviewed (defined as who shared the same hearth); gaining confidence and permission to interview (including reading a statement to protect human subjects); and, finally, conducting the interview itself.

The time taken to complete interviews varied considerably due to several factors including: the level of education and comprehension of informant; the household size and complexity; the nature of household economic activities; the amount of damage sustained due to the earthquake; and, the complexity of the reconstruction/restoration process of that household.

The policy of "call backs" for absent informants was set at two. However, this was modified at the discretion of the Field Director depending on several criteria. Basically these included the number of interviews already obtained versus the number still required; information that the family had migrated temporarily and would not return for some time; justified suspicion that the informant(s) were "hiding out" to avoid the interview; and similar factors. Except in urban areas, there were no week-end or evening interviews, and only in the urban areas when it was apparent that both household heads worked and thus could not be available during normal working hours.

It will be instructive at this point to evaluate the reasons for not completing some interviews during the first phase. Of a total of 1,853 interviews planned, a total of 1,473 were actually obtained, yielding a loss of 380, or 20.5 percent. Table 2-8 categorizes the reasons for this loss by absolute frequency and percent.

Table 2-8

Reasons for Not Obtaining Interviews - Phase I

Reason	Frequency	Percent of Those Missed in Orig. Sample of 1853 (base 380)	Percent of Total Sample Drawn (base 1853)
House Under Construction, not occupied	3	0.8	0.2
Unknown	4	1.1	0.2
Informant Incapacitated	6	1.6	0.3
Not Visited	11	2.8	0.6
Structure Not a Dwelling	31	8.2	1.7
Duplicate House*	40	10.5	2.2
Refusal	60	15.8	3.2
Unoccupied Structure**	75	19.7	4.0
Principal Informant not available	<u>150</u>	<u>39.5</u>	<u>8.1</u>
TOTALS	380	100.0	20.5***

* Duplicate house means that while mapped as separate units, the same family (household) was occupying two separate units and both physical units fell in the sample.

** Structures perhaps suitable for housing but used for other purposes, e.g. stores, warehouses, etc.

*** This represents the percentage of the original 1853 households drawn, which were not interviewed for the various reasons stated in the table.

An analysis of Table 2-8 will show that 56.9 percent of the reasons for not completing the interviews had to do with the informants' absence, refusal or incapacity; and that 30.2 percent related to "duplicate houses" and unoccupied structures - those which showed up on the map as houses but were actually used for other purposes. Such an analysis underscores the difficulty of field operations in the aftermath of a disaster of this sort and emphasizes the critical importance of interviewer training, mapping and supervision.

In Table 2-9, attrition from Phase I to Phase II is examined. It will be recalled that Phase II was basically a convenience sample based on interviews obtained in Phase I.

Table 2-9
Attrition Phase I to Phase II

<u>Reason</u>	<u>Frequency</u>	<u>Percent</u>
Informant Moved*	13	26.5
Principal Informant Unavailable	31	63.2
Informant Incapacitated	2	4.1
Died	1	2.0
Refused	<u>2</u>	<u>4.1</u>
TOTALS	49	100.0

*Usually from the community.

Table 2-9 simply emphasizes the difficulty of obtaining informants, even if they have been previously selected for certain qualities and have been previously interviewed. It is also worth noting that 42 percent (13) of the category "Informant Unavailable" came from one zone in Guatemala City.

Table 2-10 presents the categories of reasons for attrition between Phase I and Phase III. It will be recalled that a total attrition rate of 15.1 percent (222) obtained.

Table 2-10

Reasons for Attrition from Phase I to Phase III

<u>Reason</u>	<u>Frequency</u>	<u>Percent</u>
Formed part of other group in Study	1	0.4
Died	4	1.8
Informant Incapacitated	9	4.1
Refused	36	16.3
No Response*	43	19.1
Principal Informant not available	53	23.9
Moved	<u>76</u>	<u>34.4</u>
TOTALS	222	100.0

* No one home after two call-backs.

Most of the categories in Table 2-10 are quite self-explanatory. The issue of refusals, however, can be elaborated on. In some cases, this was the third interview by the same team and people just had no time for it. In other cases, the rapidly changing political climate made people not only suspicious, but fearful, of being interviewed. Similarly, although it was clearly stated that people would receive nothing for their participation in the study, this may have been misunderstood and interviewees may in some cases have expected to be paid for previous interviews. This is all the more possible because of promises made and broken by other agencies which had worked in or studied in some of the communities.

In terms of migration, of the 76 families who moved, 30 percent changed residences out of the squatter settlements in the City. Another 32 percent (25) changed residences in the larger towns: Chimaltenango (11), Sanarate and El Progreso (7 each). Thus, 62 percent of the migration took place in four of the five largest communities included in the study.

Quality Control Measures

A very real problem in research of this nature is the maintenance of the quality of the data collected. In this study this was particularly important since by using the cluster sampling method a risk of automatically increasing sampling error was being run. Because of attrition, the risk of errors may also have been increased. Especially because of the number of refusals (3.2 percent) and informant inavailability (8.1 percent), the degree of self-selection involved in the entire process is difficult to estimate.

While the above factors are largely beyond the control of any ethical research unit, another issue is critically important and can be controlled. This is the issue of interviewer training, fatigue, boredom and interpretation of informant's response. In order to minimize these factors every effort was made to fully integrate the interviewers in the construction of the instruments and the instruction books. Heavy emphasis was placed on interviewer standardization and inter-rater reliability. Nevertheless, each interviewer is an individual personality and will and must seek his or her own interview style. This is all the more true when one is interviewing illiterate or semiliterate populations. In addition, after 50 or 100 two-hour interviews, a number of ego-dissolving refusals, thousands of "probes" and "re-phrased" questions, hours of sitting in the sun and sloshing through the mud, the interviews and coding predictably will tend to become somewhat sloppy.

To guard against this as much as possible, the Field Director selected about five percent of the households for partial re-interview. These re-interviews usually consisted of 15-20 critical questions, some subject to interpretation and others more directly factual. These responses were then compared to those of the interviewer for correspondence, usually on a daily basis. Further, throughout the course of the study each interviewer either taped at least one interview per week, or did team interviewing in order to reduce coding errors. At least two days per month were spent discussing proper code categories, and in the field this was often carried on into the evenings. If a response did not seem to fit a precoded category it was noted verbatim

on the form and discussed with the group and the Field Director. This was particularly important as the team moved into new areas and unanticipated responses arose. This process also provided the opportunity to add new codes if necessary.

A second quality control feature involved the item-by-item review of each code after the questionnaires had been key-punched and verified. This was because errors had been discovered even after key-punch verification. As a consequence, the data were listed and each line was proof-read by two interviewers reading column-by-column from the forms to the printout list. A further check on the data were "range-checks." Once verified by the interviewers certain variables were machine tabulated to verify ranges. If, for example, the valid range was "0-7," and an "8" appeared, it was possible to sort on that variable for "8" and re-check the original data for the correct response. If that variable had in fact been coded "8," the score was reassigned a "missing" value.

Instrument Design

The construction of an appropriate instrument for data collection requires that the investigators be a single slave to many masters. Of primary importance is the operationalization of the central questions of the research, and the adaptation of these to the population(s) to be subjected to the task of providing meaningful responses. Any instrument must be a stimulus that provides relevant responses to a series of fragmented "questions" that ultimately provides meaningful data that can be abstracted to the level of the research questions posed. In cross-cultural research, the operations must be standardized

in such a fashion as to "mean" the same thing to all respondents. Issues of time/cost efficiency must be considered. How long can an interviewer spend with an informant? How long will an informant tolerate uninvited questions regarding his personal life and view of the world? How long before informant/interviewer fatigue distorts the question-response-probe-response-coding process?

The longitudinal design of this study called for interviews to be conducted at intervals over the three year study period. The research questions require data on households:

1. Before the earthquake.
2. Right after the earthquake, before reconstruction began.
3. Approximately two years after the earthquake.
4. Approximately four years after the earthquake.

The instrument, therefore, required the application of retrospective questions as well as current observations.

The development of the instrument required approximately four months. First, a preliminary instrument was elaborated in broad terms in English. This was translated into Spanish and then subjected to pre-test and revision on a systematic basis. When the forms were in a semi-completed state, a team of eight interviewers was employed. A decision was made to complete the instrument development jointly with the interviewer training. This system had the advantage of finalizing the language used with native Spanish speakers actually using the form in pre-test situations. Perhaps more importantly, it served to include the interviewers directly in the development of the form and to secure their active cooperation and interest in the research. They therefore not only were trained to administer and code questions, but understood the purposes of the research and the basic rationale behind each question.

After completion of the preliminary interview form, a basic instruction book was prepared by the principal investigators. This was detailed and

revised by the interviewers under the supervision of the Field Supervisor and the Senior Researcher Resident in Guatemala, as pretesting proceeded, to make it reflect what was actually being done in the field, as well as what was intended by the principal investigators.

Pretests

In its original form the household interview schedule contained a mixture of open-ended and forced choice questions with answer categories specified in advance. One of the objectives of the pretests was to develop precoded answer categories to be used in recording responses to open-ended questions. It was felt that the interview schedule would require a great deal of time to administer and that the time required could be reduced if interviewers' rewording of data could be expedited by the use of precoded categories. This would also allow an increase in cross-interviewer reliability and it would speed up the analysis process. Accordingly, the pretest was oriented towards testing the utility and wording of individual items and toward developing precoded response categories. The objectives were to generate all possible responses to various questions so that the schedule could be precoded. In other words, interviewers were not attempting to obtain responses from this first cadre of informants that could be statistically analyzed, but rather to determine the range of possible responses which would be encountered in the field.

Once these data were accumulated, a new revised form was designed for testing on selected populations. This second pretest was carried out on a sample of 30 individuals in Guatemala City, Palencia (Ladino), Mixco (Indian and Ladino), and San Juan Sacatepequez (Indian). As

anticipated, the basic portions of the instrument - those dealing with household composition, socioeconomic status and general household characteristics - worked fairly well. The major problems encountered were with questions requesting information on people's immediate responses to the earthquake during the emergency period and their experiences with the provision of emergency relief materials and assistance. One problem area was determined from the initial pretest experience. This was the homogeneity of responses to the trauma of the disaster itself. That is, everyone reported that he did basically the same thing. In conjunction with this problem of homogeneity was the difficulty of determining accurately the sequence of activities. People simply did not recall the sequence of events; or, cognitively they did not order their recollections along a temporal dimension. The conceptual scheme used in this schedule for understanding their behavior right after the earthquake was based on a time ordered pattern of events. Subjects apparently could not report their behavior this way. While the cognitive ordering of events on the part of the affected populations is of great interest, the instruments and time necessary to determine along what cognitive dimensions victims order their experiences was not available. The preliminary pretest does show, however, that earthquake victims in Guatemala do not seem to order their memories of the event in terms of a temporal sequence. As a consequence of this experience, a redesign of that portion of the interview dealing with the immediate post disaster period was necessary.

Most of the pretesting was done in cumulative fashion. That is, each section of the schedule was tested and revised until it was

determined to be satisfactory. The next section was then begun, but preceded by the finished portion. This provided ongoing training in the use of the instrument as well as refinements of minor points in the interview schedule.

The fundamental issues surrounding the pretest data were:

1. Information load of the items.
2. Intelligibility of the phrasing to informants (especially Indian translations).
3. Relevant responses and correspondence to coding categories.
4. Standardization of coding by interviewers.
5. Format of the schedule for: (a) organization of items, (b) ease of coding, and (c) retrieval for keypunching and verifying.
6. Feedback for adherence to basic research questions.
7. Development and revision of the Instruction Booklet.
8. Administration time.

In total, 262 formal pretests were done. An additional 100 were conducted on an informal basis in preliminary testing and interviewer training. Table 2-11 shows the locations and quantity of pretests distributed by ethnicity.

Training

As noted above, interviewers were hired and trained in conjunction with instrument construction and pretesting. This procedure proved fruitful in numerous ways. First, interviewers became intimately familiar with all aspects of the study and its rationale. Second, they were able to contribute actively and substantively to the instrument

Table 2-11

Pretest Distribution

<u>Community (Department)</u>	<u>Ladino</u>	<u>Indian</u>	<u>Total</u>
Parramos (Chimaltenango)	10	17	27
Palencia (Guatemala)	30	-	30
San Andres Itzapa (Chimaltenango)	6	18	24
San Lucas Sacatepequez (Sacatepequez)	2	22	24
Subinal (El Progreso)	16	-	16
Santa Lucia and Casas Viejas (El Progreso)	79	-	79
El Florido (El Progreso)	11	-	11
El Paso de Las Jalapas, El Jicaro (El Progreso)	21	-	21
Various Indian Communities	-	30	30
Totals	175	87	262

design for phase two of the survey which focused on attitudes and beliefs, community activities, etc. Third, over the course of the study only one person resigned -- to take advantage of a chance to travel to Europe; and no one was dismissed. As a consequence, a source of error in the data which would have been introduced if interviewers were constantly changed, was avoided. This section will describe the selection and training process for the field interviewers.

After considerable discussion, it was decided to employ female interviewers. The principal reason was that the interviews would be conducted during the day and thus the principal informant would most often be the female household head. In addition, a sub-sample would be requested to

provide fertility histories, requiring a line of questioning culturally inappropriate for nonmedical male interviewers. Finally, the instrument basically deals with information available to most female household heads, with only a small portion devoted to specific economic questions involving land tenure and production. Experience in similar surveys indicated that in either the case of male or female informants, economic facts are usually under-reported.

The eight interviewers finally selected were interviewed by the Guatemalan INCAF staff members with a combined experience of about 21 years working with interviewers, the Field Supervisor and the Senior Resident Researcher. The criteria for selection included a willingness to work in rural areas and to spend the work week there; previous living or working experience in rural areas; and "objective" interest towards the earthquake and the reconstruction processes; a "personality gestalt" suitable to interviewing; and an acceptable education level (such as primary school teacher, home educator, e.g. U.S. high school equivalency). It was decided not to attempt to select on a basis of ethnicity or language facility in a Mayan dialect since a great number of interviews would be in Ladino areas. One "ladinized" Cakchiquel speaker was selected, however.

To cope with language difficulties arising in Indian villages, it was decided to hire local female translators to work with interviewers as necessary. In three of the most isolated (thus non-Spanish speaking) communities, another project was in process under the direction of the Senior Resident Researcher. Although the design was less sophisticated,

many similar data were being collected, and the training was similar to that provided to these interviewers. Arrangements were made to assign work to this team as required. Thus, it was decided that local translators, supervised by the interviewers, would be adequate in the less traditional communities.

Interviewer training was begun in October, 1977, and consisted of four basic phases. Phase one, orientation, included an introduction to INCAP, the global objectives of the project, a classroom introduction to interviewing, and an introduction to data processing. Tests were administered on the principles of interviewing, dictation (i.e. ability to take notes while listening), and legibility of numerals (for later key punching accuracy). Throughout this process, the objectives of the project were stressed, as were the kinds of data to be collected.

Phase two consisted of classroom orientation to the preliminary instruments and instruction booklet. Presentation of these documents was done with the understanding that modifications would be made, but that most of the substance would remain the same. Initial training in this phase consisted of memorization of many of the code categories, role-playing, and discussions of the rationales behind many of the operational questions.

Phase three consisted of doing actual interviews. The interviewers were first assigned to conduct interviews with family or neighbors. The purpose of this was to permit them to concentrate on the substance of the questions rather than on the other techniques of interviewing, e.g. gaining rapport, redirection, etc. This was done - as was the rest of

this phase - with segmented portions of the instrument. Time is obviously a factor with this instrument and it was decided not to burden both interviewer and informant with excessive material until the interviewers had gained a high degree of facility with each segment of the interview. This also allowed pretesting and revision of each segment of the schedule.

This phase also included training in the techniques of standardization so that both the questions and the coding would be accomplished in as near an identical fashion among interviewers as possible. This was done through two techniques. First, a single interview was tape recorded and then coded by the entire group and the responses and coding were evaluated for discrepancies and errors and discussed with the group. A second technique used was to have two interviewers call on a single informant, with one asking the questions, and both recording the responses independently for subsequent comparison. Discrepancies in coding were analyzed to determine if differences were due to interviewer error or to unclear definitions of the code categories. When unclear categories were discovered they were reworked. If it appeared to be interviewer error or carelessness, more classroom time was devoted to drilling on questions and codes.

Phase four was a sophisticated extension of phase three. Much more time was spent in field activities aimed at strengthening the instrument in terms of its comprehension to the informant and its ease in administration for the interviewers. Additionally in phase four, the interviewers participated actively in the final design of the instrument and instruction

booklet³ so that these would be accurate documents reflecting how the questions were actually phrased and responses coded.

The Interview Instrument

The final instrument was designed to be used in two waves of interviewing of the same households approximately two years apart. It contains five principal sections organized by conceptual homogeneity:

1. Household composition and characteristics.
2. Agricultural and other economic activity.
3. Housing characteristics and level of living.
4. Disaster, relief and reconstruction experience.
5. Health, fertility and nutrition.

The following paragraphs briefly outline the types of data contained in the five sections of the schedule. Each question in the schedule was stated in Spanish and accompanied by precoded answer categories obtained from pretest experience.

Household Composition. This section collates data on the personal history of individual members of the household, such as age, education, ethnicity, occupations, dress, wages earned, relationships to household head and so forth. It also includes a series of questions on individuals who were living in the household at the time of the earthquake but no longer form part of the contemporary household. After determining the composition of the contemporary household, the informant was asked to name all those who lived with her/him in January, 1976. The names are then recorded along with sex, relationship, age in 1976, current residence if known, date of death and cause of death if known. This information

can easily be combined with that from the contemporary household data (which is also keyed for presence in household in January 1976) to determine changes in household composition by comparing composition before the earthquake and contemporaneously.

Agricultural and Other Economic Activities. Data pertaining to income and land tenure (except for profession, occupations, migration and salaried income) are included in this section. This portion of the instrument received considerable attention during field testing. Obtaining accurate measures on land tenure and income is a chronic problem. The reasons are numerous and include the fact that some individuals honestly do not know the answers to income and land tenure questions. Others underestimate answers to income and land ownership questions out of fear of increased tax burdens or any number of other reasons that are justified on the grounds of privacy. Agricultural prices vary throughout the year and obtaining total crop yield and multiplying by an average price factor sometimes is highly inaccurate as a basis for estimating income. Earnings from many small businesses are not known by their proprietors since accounting records are rarely maintained. In addition, many small business accounts are also used as home expense operating funds, thus clouding the question of income. Further, relatives often contribute to the family income, but this may not be considered as "income" by informants. Because of these reasons, a gross measure of land tenure, estimates of annual income by crop, sales and purchase of land since the earthquake, estimates of annual income from home industries and businesses were accepted for purposes of this study. Additionally,

in the household composition section, questions asked for estimates of weekly income from wage earners. It was believed that by covering a wide range of possibilities, relative economic status rankings could be arrived at within any single community that will have reasonable validity. It is also believed that this basis for measuring economic status and income permits valid before-after earthquake comparisons.

it should be noted here that there are two cross-checks on this data that should provide some measure of validity. These are house construction and level of living scale before the earthquake. There should be reasonably high correlations between the income and land measures and these other two scales. Finally, in case the data proved to be totally unreliable in the sense of forming accurate interval scales, it is possible to fall back on a nominal scale (yes/no) to try to determine the degree to which individuals use multiple strategies to gain a living, and if there were changes in these strategies before and after the earthquake.

Housing and Level of Living. The principal problem encountered in pretesting was how to handle multiple dwellings occupied by the same household group since the earthquake. It was discovered that some families had obtained more than one "reconstruction" house and that some had changed the functions of a rebuilt structure from "house" to "store" to house several times. The original plan was to work with sequencing on the assumption that there would be a progression from house to house. However, while this is true in the sense that structures

were erected sequentially, it does not necessarily hold with respect to how such structures may actually be used. An example may make this problem more clear. One family's home was destroyed completely. They first constructed a temporary shelter; then received an agency constructed house, and then built a structure intended as a house from their own funds. The agency structure is now used as a small store, and they live in the house which they built themselves. However, they plan to add-on to the agency house and move their living quarters back to that structure and transfer their store to the privately constructed house. The problem was not simply to define a sequence, but to define a "house" and to key on it as questions relating to housing characteristics are asked. To resolve this issue housing categories were modified to obtain the following kinds of information: use of temporary shelter by length-of-time; new structure I, and new structure II with all specific questions pertaining to wall, roof, etc., where either of these "new" structures can refer to the repair or new construction, and is defined by the month and year of when it was constructed and first occupied or reoccupied. In addition a multiple use code for each structure was developed. Further data include who or what agency built the structure and under what conditions it was obtained.

In addition, this section of the interview includes a series of questions on who decided on the design, did the labor and how the materials were obtained to repair and/or construct these structures. Opinion questions were asked relative to the positive and negative aspects of the structures. Further, the schedule included questions to

determine what people heard (messages received) about how to build an earthquake resistant house and from what kinds of sources, e.g. personal, print, radio-television.

The level of living scale was designed to fit the cultural settings of the study. The following items were included: source and distance of water supply, kind of home illumination, food storage, sanitary facilities, cooking fuel and type of cooking facility used. These are all arranged to be coded both before the earthquake and contemporaneously. We also asked for damage estimates of these items where appropriate.

Relief and Reconstruction Experience. Since the housing issue is so complex, it was decided to categorize "Reconstruction Experience" as a separate conceptual area. It should be mentioned that in analysis these two categories overlap in a number of areas.

One of the principal issues which emerged early in the agency interviews was the concern regarding food distribution, its equitability, cultural compatibility and its perceived market impact on locally produced foods; in other words, its appropriateness in general. These questions have several operations which are designed to provide the necessary information to answer the major questions, including itemized lists of what was received, its perceived utility, its manner of distribution within the community, and direct questions on pricing.

Further operations designed to tap the relief and reconstruction efforts include the listing of other types of assistance provided, items designed to determine the perceptions of the most valuable kind of assistance provided, the sources of the assistance, and the informants' subjective evaluation of the efforts in their community, including

questions on how - from their point of view - the assistance efforts should have been managed.

Fertility, Health and Nutrition. Because of the length of the interview, it was decided to reduce the coverage for this portion of the research to a ten percent sub-sample. The fertility history questions were amply tested and interviewers competently handled the complexity of the probes involved. The basic task was to elicit a total pregnancy history from the randomly selected female household head. This includes abortions, stillbirths and all other births. If any birth has resulted in a death, then the date and cause of the death is recorded. Data were also obtained through anthropometric measurement on all children in the household under five years of age.

References

- Bates, Frederick L; C. W. Fogelman; V. J. Parenton; R. H. Pittman; and
1963 G. S. Tracy
The Social and Psychological Consequences of a Natural
Disaster. Disaster Study Number 18. Washington, D. C.:
National Academy of Sciences.
- Campbell, Donald T. and Julian C. Stanley
1963 Experimental and Quasi-experimental Designs for Research.
Chicago. Rand McNally College Publishing Company.
- Rossi, Peter H. and Howard E. Freeman
1982 Evaluation, A Systematic Approach. Beverly Hills, California.
Sage Publications.
- Weiss, Carol H.
1972 Evaluation Research, Methods of Assessing Program Effectiveness.
Englewood Cliffs, N. J. Prentice-Hall, Inc.

Footnotes

1. We have used the terms Indian and Ladino to characterize all communities except those in Guatemala City. Especially for the highland towns this should be understood to mean the predominant population in terms of size. The terms are useful generalizations and should not be taken as if they were absolute definitions based on rigid scientific criteria.
2. Zaragoza is a special case since it is a Ladino community in a basically Indian region.
3. Each of the three survey phases has a detailed instruction book. This provides detailed information on how to ask questions, definitions of all terms used, coding categories and so forth. The instruction books for each phase are about two hundred pages.

Chapter 3

The Disaster and the Guatemalan Government's Response

Frederick L. Bates, Luis A. Ferraté and Robert E. Klein

Introduction

In order to understand the organization of the Guatemalan government with respect to environmental and man-made hazards it is necessary to look at the problems it faced at the time of the earthquake from two perspectives. One, the geographic perspective locates Guatemala in an area where natural phenomena release vast and sudden amounts of energy. Geomorphic processes such as earthquakes, volcanic eruptions, erosion and mass earth movements, as well as meteorological events such as hurricanes, storms and floods, are some of the products of these releases of energy. All are part of the natural order generated by continuous and dynamic energy transformations and flows of earth.

Guatemala is situated among three tectonic plates, the North American, the Caribbean and Cocos. The boundary between the North American plate and the Caribbean one is delineated by the Motagua and Polochic fault systems that divide the country in an East-West direction (Dengo 1968:9). The boundary between the Cocos and Caribbean plates forms a subduction zone where the Cocos plate is submerging under the Caribbean (Harlow 1976:12). These geological characteristics cause seismic activity along the boundaries of these plates and produce earthquakes of large magnitude and intensity,

such as the 8.3 Richter scale magnitude earthquakes of 1902 and 1942 (Vassaux 1969:87). Destruction due to such intense seismic activity (Vassaux 1969:86) occurred in 1541, causing the destruction of Ciudad Vieja by a mud avalanche, and in 1773 the destruction of Antigua Guatemala in the Panchoy Valley. In 1859 the southeastern towns of Taxisco, Escuintla, Sta. Lucia Cotzumalgaupa and Amatitlan were severely affected and tidal waves were produced along the Pacific Coast. In 1902 Quezaltenango and Salcaja were destroyed and San Cristobal Totonicapan, San Marcos and other towns were heavily damaged. During 1917-1918 Guatemala City and other towns in the Valley of the Virgen were destroyed.

Finally, there was the earthquake of 1976, which is being examined in this study, that partially destroyed Guatemala City (39%), the departmental capitals of El Progreso (100%), Chimaltenango (100%), Salama (75%), Solola (50%), Antigua Guatemala (25%), Totonicapan (\pm 50%), Quiche (46%), Puerto Barrios (15%), Zacapa (50%), Chiquimula (10%), Jalapa (50%), and Jutiapa (10%). In this earthquake forty-two major municipal towns with populations of from 3500 to 15,000 were destroyed (100%) or severely damaged (50%), and 52 other major municipal towns with similar populations were partially destroyed (10% to 49%) as well as hundreds of rural villages, hamlets and other small communities.

The official damage reported by the Guatemalan government for the 1976 earthquake made through the National Reconstruction Committee - NRC - in May, 1978 (Balcarcel 1978:4), stated that the earthquake of 1976 was of magnitude 7.5 on the Richter Scale and of intensities from VI to XI on the Modified Mercalli scale. According to this report, approximately 25,000 people were killed and 78,000 severely injured. The

earthquake destroyed approximately 258,000 houses, 5,215 classrooms, 82 hospitals, health centers and posts amounting to 80% of the health infrastructure and services in the earthquake areas. In addition, one hundred and thirty-three public buildings were destroyed or heavily damaged and approximately 220 kilometers of paved roads and 180 kilometers of gravel roads were destroyed. Furthermore, several bridges, including three of the largest and most important ones in the country, collapsed. In addition, most of the cultural patrimony of the country, including precolonial and colonial monuments and buildings were either destroyed or severely damaged and the landscape legacy of the past was heavily affected. The economic loss from the earthquake was initially estimated to be 1.021 billion quetzales (1 quetzal = 1 USA dollar) and later 2.0 billion dollars (Barcarcel 1978:4). In addition, damage to the environment and to natural resources was estimated to be approximately another 1.9 billion dollars (Ferraté 1978:10).

Such periodic geomorphic processes as earthquakes and hurricanes become hazards and disasters when the communities and societies exposed to them have not developed adequate and rational mechanisms to cope with such environmental phenomena. The cultural order, as an expression of these mechanisms, expresses not only a relationship between man and nature, but also a degree of awareness in the form of value codes and attitudes which furnish a level of understanding of the consequences of these natural phenomena and the releases of energy associated with them. These consequences can be, and most of the time are, disastrous when any given culture, through the practices it promotes, transforms a potential hazard into a disaster.

On the other hand, any release of energy and its products can also be perceived and processed by a society as a natural asset with potential benefits to the communities that experience it. The energy released by nature as part of a natural phenomenon such as an earthquake or hurricane sooner or later becomes either natural resources, raw materials, and goods and services through the input of appropriate technology or it may become the source of mechanisms for change which promote innovation and the adoption of new concepts, ideas and patterns for survival and development of the culture.

A natural phenomenon can either be seen as a potential hazard with disastrous consequences or as an input of energy that can create mechanisms for adjustment, survival and development. This possibility was perceived by a group of Guatemalan scientists with field experiences in development activities at the moment of the catastrophe. Some of them were called to participate in defining the role of the National Reconstruction Committee - NRC - and initiating its activities. As a consequence, these ideas were incorporated into the philosophy, objectives and purposes of the reconstruction process at a very early stage.

In addition to the ecological or geographic perspective taken above, a second or historical perspective must be taken. Guatemala is like a germplasm or a cultural pool, with a variety of social organizations derived from the diversity of indigenous and exotic cultures that have merged in that area, mostly on a linguistic and regional basis. Gradually, since colonial times, much of this cultural diversity and its variety of response patterns to natural or man-made hazards has been lost.

Western values, technologies and beliefs have gradually been substituted for indigenous ones by a process of cultural diffusion which has produced a "landscape homogenization" that has not only simplified natural ecosystems, but has disrupted many of the cultural patterns furnishing adaptive responses to environmental phenomena. This process of "landscape or cultural homogenization" has increased the fragility of human settlements to geomorphic and meteorological processes and has considerably increased the potential of natural hazards to produce disasters. The introduction of exotic goods and services sometimes produces benefits and promotes development in developing countries, but at other times such innovations have not been introduced along with sufficient cultural acceptance, technological knowledge, economic support and environmental adaptation to be an adequate and convenient replacement for indigenous goods and services already adapted to geomorphic and meteorological phenomena. Since colonial days in Guatemala, such innovations have sometimes been promoted by the church, and by the national and local governments and other institutions.

This process of severe cultural disruption has been magnified in recent times by the introduction of other "civilized" technological patterns such as the use of long-term biodegradable pesticides, detergents and other agro-chemicals. It has also been produced by the monoculture of coffee, cotton and bananas on lands that are more suitable for producing basic grains, causing spatial disorganization and the intensification of plantation-type agriculture that substitutes shifting westernization cultivation techniques for indigenous ones and often uses

several calories of energy to produce just one in food. All of these trends have resulted in the systematic destruction of tropical forests in order to produce export products which are sold mainly to industrialized societies such as the United States.

With respect to the "development" of human settlements, diffusion from industrialized societies has introduced the use of energy expensive services and materials that make urbanites dependent upon large corporations. Products such as corrugated tin and asbestos roofs; prefabricated wall panels, the use of concrete or wood, or brick as building materials, and the introduction of electronic equipment such as sophisticated T.V.s and radios, electric brushes and vacuums and the consumption of canned and dehydrated foods have been introduced into the rural agricultural communities of Guatemala and have enhanced consumerism. Finally, the concept of industrialized production using bureaucratic management has been transferred.

Such technological transfers have increased local industrial capabilities at a higher energy cost but most of the time the products produced are not accessible to the poor in either rural or urban communities. Such people have become cheap labor for use in the production process. Meanwhile they have become dependent on urban industrial employment and no longer produce their own subsistence.

Guatemalan culture has not been able to absorb all of these innovations flooding in from the developed world without being partially disrupted. These man-made change processes have introduced more risks and hazards to human life in the form of anti-goods and anti-services, such as agro-chemical and pesticide pollution in the Pacific Coastal

plain, pumice grabens in the volcanic highlands and river flood plains, and massive erosion processes in the highlands due to overpopulation and lack of available agricultural land. Some of these factors are producing irreversible terminal landscapes in parts of the country increasing and magnifying the potential of floods in the lowlands as well as decreasing the capacity of the land to produce biomass.

The Guatemalan government, with its small scientific and technological resources, realized after the earthquake that the relief, rehabilitation and reconstruction processes should take into account these problems and try to avoid patterns of "development" in the reconstruction process that might mean dependence in the long term. The National Reconstruction Committee was aware that increased dependence could not only result in future disaster-caused injuries and loss of lives, and in disrupted infrastructure, but could also produce economic hazards and risks as well as social turmoil, political problems and even political violence (Rivera 1976).

Some members of the National Reconstruction Committee believed that the process of "landscape homogenization" through westernization, industrialization and urbanization, which the Guatemalan government had supported for a century, had increased the potential for hazards and disasters, since both should be seen not only as the product of natural phenomena, but also as a result of man's maladaptation to them.

This degree of environmental awareness, however, was shared by very few, and the Guatemalan government, through its Plans of Development had indirectly magnified this potentiality by conceiving of the environment

as only another sector of the economy and not as one dimension of a complex sociocultural system. A few Guatemalans with a more ecologically and community oriented view of development felt that the development plan promoted the adoption of exotic innovations without sufficient knowledge of their consequences and diminished the cultural carrying capacity of Guatemalan society by reducing its level of adaptation to its environment. Some believed that this plan would reduce the capacity of the society to respond and adjust to sudden releases of energy such as earthquakes, volcanic eruptions, hurricanes, floods, storms, pollution and erosion, as well as to the accelerating urbanization process and to the rapidly increasing consumerism which was accompanying it. This was the panorama of Guatemala before 1976.

For several years, the Guatemalan government had been attempting to cope institutionally with these magnified environmental hazards and risks by creating a series of institutions designed to respond to specific emergencies. As a consequence, the Ministry of Health and Public Assistance had been put in charge of epidemiological and pollution hazards; the Ministry of Agriculture was assigned biologically related risks such as pest infestations and sanitary animal and plant control; the Ministry of the Interior, through the Advisory Commission for the President of the Interministerial Council for the Improvement of the Human Environment, was made responsible for the normative aspects of environmental hazards, risks and disasters; and the Ministry of Defense, through the National Emergency Committee - NEC - was assigned responsibility for the effects of geomorphological and meteorological hazards and

disasters as well as some man-made accidents.

On the one hand, Guatemala in 1976 was a country where natural phenomena periodically released vast amounts of energy and where communities were becoming more vulnerable to natural hazards and risks resulting from environmental degradation and cultural disruption. On the other hand, the Guatemalan government had created a national level institutional structure to cope with some of these risks - the National Emergency Committee. But in 1976 when the earthquake struck it had not as yet increased its capacity to respond to natural and man-made phenomena at the local level.

National Emergency Committee - NEC - its Composition,

Organization and Functions

Before the creation of NEC in 1969, the Guatemalan government's response to hazards and disasters was carried out mainly through the army and through municipal and voluntary firemen's organizations, The Red Cross, The Boy Scouts, cooperatives and other private organizations. Most of the relief and rehabilitation processes were coordinated by the army and The Red Cross. In spite of their humanitarian orientations, considerable functional and geographical overlapping occurred and improvised solutions to problems often took place. There was no formal organization in charge of emergency, evacuation and relief programs.

The National Emergency Committee was created to cope with environmental hazards and disasters on September 8, 1969, when the Pacific Coastal Plain experienced one of the worse floods on record. Between 1969 and 1970, the NEC attempted to become the coordinating entity for

all relief and rehabilitation actions. It did not, however, have full legal credentials to perform this duty. Finally, on September 28, 1971 its status was legalized as a part of the Presidency of Guatemala working through the Ministry of National Defense (CRN 1977).

The NEC is a permanent entity and is activated wherever an emergency is declared by the President and ratified by the Guatemalan congress. The Minister of National Defense is the President or Chairman of the NEC and therefore the army has primary control over it. There is a Board of Directors that is formed by the Ministries of the Interior, Public Finances, Agriculture, Communications and Public Works, and Public Health and Social Assistance, as well as by representatives of the Chambers of Commerce and Industry, the Associations of Banks, Agriculturalists, newspapers and reporters, and The Red Cross. This Board of Directors is the highest authority of NEC and is presided over by the Minister of Defense who is second in authority to the President.

The most important executive on the NEC is the General Coordinator who is the third ranking authority below the President and Minister of Defense. The Coordinator executes, coordinates and directs the actions of the NEC during an emergency or relief operation. This General Coordinator is named by the Minister of Defense and approved by the Board of Directors and is by law an experienced senior army officer. This army officer is assisted by four other persons, the Secretary, Treasurer and the Public Relations officer as well as a sub-coordinator who is also an army officer.

At the operations level, the NEC coordinates its actions through

an Operational Emergency Command that integrates the actions of the Ministry of Public Health, The Red Cross, the firemen and the army. Every one of these organizations has regional and local representatives in different areas of Guatemala and they form the main structure of the local NECs. Most of the field staff is formed by army officers trained in relief and emergency operations. During disasters the whole operational structure functions as an army unit, with the same channels of command, and with its main headquarters in Guatemalan Air Force buildings in the Aurora airport, Guatemala City. During emergencies the committee also has temporary regional offices associated with army regional headquarters.

The NEC performs two principal functions: (1) its coordinates all governmental and private institutions engaged in relief operations and (2) it organizes the provision of food, clothing, shelter, medical and sanitary services to people or refugees affected by natural phenomena or manmade events such as accidents or neighboring wars. The NEC has the authority to require any type of services, manpower, machinery and other logistic support from any government institution to cope with the consequences of a disaster and to rehabilitate basic services. In spite of this, its purpose is mainly to respond to the immediate impact of a disaster by offering emergency relief.

For the most part, the NEC uses the logistical structure of the Ministry of National Defense to perform its activities and relies very heavily on the firemen, police, cooperatives, The Boy Scouts, The Red Cross, and other private voluntary organizations to carry out its work.

Since it was founded, its work has been efficient and effective, especially during the 1976 earthquake.

The most important activities carried out by the NEC were those related to floods in the Pacific Lowlands in 1969, 1972 and 1974 and in connection with volcanic eruptions of 1971-1972, 1973 and 1975. It helped in Managua after the Nicaraguan earthquake of 1972 and in Honduras during search and rescue operations following Hurricane Fifi in 1974. Due to increasing manmade risks in Guatemala resulting from the degradation of ecosystems caused by innovations which disrupt traditional cultural responses to hazards and disasters, the National Emergency Committee is an institution in constant demand.

The Immediate Response of the Guatemalan Government
and NEC to the Earthquake of 1976

The NEC and other Guatemalan relief organizations have a limited capacity to respond to large natural or manmade disasters. As a consequence, the Guatemalan government could not respond efficiently and immediately to a disaster of the magnitude, extension and impact of the 1976 earthquake.

Initial awareness of the size, importance and extensiveness of damages of the earthquake came from individual members of the NEC and scientists located in Guatemala City. Within four hours, when the army communication systems became operational and information was collected from persons looking for relatives in Guatemala City, the situation was at least partly known for the metropolitan area and its surrounding towns.

Guatemalan geologists from the National Institute of Geography (NIG) and geomorphologists from the National Institute of Forestry (NIF), however, knew that an earthquake of this type and magnitude had to produce regional damages and that a national state of emergency should be declared. When the NEC was informed about these conclusions a reconnaissance survey was speedily organized.

By dawn the first army and private helicopters took off from the Aurora airport, Guatemala, to make the first general inventory of the human toll and infrastructure damages caused by the earthquake. By about 12:00 P.M., a relatively complete picture of the magnitude and extension of the damages was put together and a conception of the main needs was formed on the basis of this reconnaissance. The Guatemalan government called officially for international cooperation and aid. Since early in the morning of February 4, neighboring countries had been helping. Most services were out of order but telephones continued to operate in well-off neighborhoods. Consequently large parts of the city had telephone service during the first and second days following impact. Electricity was restored during the first week after the quake.

The only reliable broadcasting system in operation during the morning of February 4, 1976 was the small broadcasting station operated by the Seventh Day Adventist Church and through it, other regions of Guatemala and the people of neighboring countries learned about the tragedy. Soon the flow of national and international emergency relief supplies began to arrive in a massive way.

The NEC established its operational services in its headquarters in

the old terminal building of the Aurora airport and during the first three days its main concern was with coordination of search and rescue activities; the establishment of refugee camps; the temporary restoration of basic services such as water, sewage systems, communications, transportation, and the opening of public markets, the burial of the dead and the supplying of medical services for the injured. In addition, a more specific inventory of the damages, deaths and impacts on the social, economic and ecological structures of the area affected by the earthquake was taken.

The NEC had a disaster contingency plan, but it was not designed for a disaster of this magnitude and dimension. Therefore, the NEC had to adjust its plans to real present conditions (Echeverria Vielman 1977). At the same time, the NEC was trying to coordinate the activities of national and international institutions that were offering assistance. Unfortunately everybody had different ideas about what to do and different orientations as to their own potential roles. As a result, disorder and confusion was created and the effectiveness of the NEC was decreased. To avoid this potential for chaos, the NEC took a very strong position and decided to send relief organizations who wanted to cooperate to rural areas and population centers outside of Guatemala City to start their activities. They wanted less talking and more work.

By February 12th, the NEC was in control of most emergency relief operations and most of the municipios had reported the number of deaths and injuries, the extent of housing destruction, and other infrastructure losses. This information was reliable for urban places but due to their

inaccessibility, very little information came in from rural hamlets and sparsely settled areas. Meanwhile, the NEC divided its operational activities into three sectors, the western highlands, the eastern highlands (Motagua low plains) and the metropolitan area of Guatemala City. Two coordinators were appointed to the rural sectors outside the metropolitan area and the mayor of Guatemala City took responsibility for the latter one.

The NEC also formed about 65 field teams, made up of an army officer and a civilian (most of the time an engineer) and gave them responsibility for the coordination of search and rescue, burial and demolition activities. They were also responsible for the rehabilitation of basic services, the establishment of refugee camps, the establishment of sanitary and health operations and any other activities needed to avoid problems derived from the emergency created by the earthquake.

After February 12th, when most of the dead and injured had been taken care of, the NEC focused its attention on four activities. The first was the clearing and opening of transportation and communication systems. About 1026 major landslides that represented about 310 million cubic meters of debris (Ferraté 1976:3) had fallen over highways, roads and river basins. Some streams had been blocked, producing reservoirs that had to be drained to avoid damages downstream. The second major activity concentrated on was the provision of basic services - food, medical, shelter, clothing and others - as well as on the organization of emergency distribution systems utilizing mainly army personnel, university students, and Non-government Organizations (NGOs). The

third activity concentrated on the demolition of structures that were severely damaged by the earthquake and too dangerous to leave standing. This activity was accomplished by salvaging construction materials and the disposal of the rubble. Finally, the NEC focused on the coordination of efforts between the government and private agencies.

Some agencies, both public and private, were using approaches defined by the committee as being paternalistic. Such approaches were considered undesirable since they were creating social tensions by giving aid away indiscriminantly to disaster victims. In order to cope with this situation, the NEC formulated plans which later became its basic program with the names of: (1) Operation "Techo" or shelter, (2) Operation "100 Days," (3) Demolition and Rubble Removal, and (4) the formal Coordination Program of Non-government Organizations (NGOs).

In addition, the NEC very effectively supported some actions taken by private or autonomous organizations. Among the most important ones were:

- It sent out an international call made by Guatemalan scientists for cooperation in order to study the earthquake, its origin, impact, and damages. The international scientific community answered this appeal in such a positive way that the Guatemalan earthquake has been intensely and continuously studied since 1976, and is one of the most well known natural phenomena in the world.

- It took the advice given by Guatemalan scientists to send the supplies that were landing at the Aurora airport to the

most heavily stricken areas as soon as possible in order to avoid a situation similar to the one created in Managua when uneven distribution of emergency goods and services created social unrest, speculation and political problems during the earthquake of 1972. The NEC policy was "to help at the maximum level and to help those in need."

- It supported the initiative of the University of San Carlos to send about 250 teams of students to provide medical and engineering services to the most damaged rural communities. Every team was composed of two students, one medical and one engineering or architectural student. This program was one of the most effective because the students (through a program known as Professional Supervised Field Exercises - EPS) not only provided urgently needed services but also channeled supplies into appropriate local organizations and organized communities and assisted in demolition and rubble disposal, the salvage of construction materials, the setting up of refugee camps and the organization of local groups for the future development and reconstruction programs.

- It supported the coordination efforts of the municipality of Guatemala City with other institutions to rehabilitate the basic services of the metropolitan area, such as potable water, waste disposal, sewage systems, transportation and communications, as well as to compile a detailed inventory of the damages to the infrastructure and the industrial capacity of Guatemala City.

-It also helped to organize a general broadcasting and communications center to alert the population about potential hazards and prevent injury, and to inform the public about the development of the relief and emergency operations. This broadcast network was also used to allow the people to communicate with relatives and friends, to report any water losses or disruption of services, to control potential looting (fortunately there was no looting), to inform the people about the location of food, clothing, shelter, lost and found, medical, transportation centers and other services and finally, to keep everybody busy in productive activities. The area initially covered by this coordination was the metropolitan area with about 1.7 million people.

- The NEC tried to expand these activities to other urban centers and was very successful in doing so. By approximately February 20, in spite of all the problems, most of the urban centers (metropolitan area of Guatemala City, departmental capitals, large towns and villages) had rehabilitated most local services and an emergency broadcasting system and land transportation network was operating.

During the first few days and weeks after the earthquake the NEC reacted very efficiently and most of its operations such as search and rescue, rehabilitation of public services, and the promotion of community cohesiveness were effective. During this time period, three distinct institutional groups cooperated with the NEC. Each had a different approach and different goals for the rehabilitation and reconstruction process. One group was formed by an association of representatives from autonomous

private and government organizations joined together by the Guatemalan Chamber of Construction. This group consisted of some members of the National Economic Planning Council, the National Housing Bank (BANVI), the Municipality of Guatemala City and the Institute of Insured Mortgages (FHA). It was concerned about the impact of the earthquake on the National Development Plan 1975-1979, because the disaster could affect the policies, strategies and goals of the plan. As a consequence, this group felt a "transitional policy and strategy" was needed to link the goals of the reconstruction process with the development goals set for the period 1975-1979 (Rivera 1976). This idea was considered valid by the government and the first plan formulated by this group was called "The National Plan for Emergency Urban Reconstruction" - later called the "100 Days Plan."

The immediate objectives of this plan were: (a) the demolition of severely damaged houses and other structures (about 15,000 in Guatemala City and another 107,036 in the other affected areas) (Rivera 1976) and the disposal of rubble and debris (about 11.0 million cubic meters) before the beginning of the rainy season, approximately 100 days from February 14, 1976, the day that this plan was presented to the President of Guatemala; (b) the "Shelter Operation" that consisted of providing seven corrugated tin sheets as roofing material plus wooden poles and beams to build a temporary shelter for affected families. The original goal was to reach at least 40,000 families in Guatemala City and about 107,000 families in the rest of the affected area. The total cost of demolition, rubble and debris disposal and the shelter operation was estimated at 11.9 million U.S. dollars. Eventually only part of the

demolition, rubble and debris disposal program was executed at a cost of about 2.9 million U. S. dollars (Rivera 1976). About 655,000 U.S. dollars were invested in refugee camps in Guatemala City, but there are not reliable data accessible for other parts of the affected area.

The NEC worked very closely with this group as they developed a coordinating scheme to carry out plans (a) and (b). The committee recommended the municipality of Guatemala City as the entity in charge of operations in the metropolitan area and the National Housing Bank (BANVI) as the institution for the acquisition, management and legal responsibility for funds in other urban areas and the National Bank for Agricultural Development (BANDESA) with similar responsibilities in the rural areas. The Guatemalan army was to become the body to provide the logistical support and the control of the operations. This group became known as the "100 Days Plan Group."

The second group of institutions was formed by the General Secretariat of the National Council for Economic Planning (GSNCEP) and the Bank of Guatemala. These two institutions were concerned mainly with economic and financial matters and with how the earthquake might affect the economy and the National Plan for Development 1975-1979. Their role during the emergency period was based upon a Presidential Mandate dated February 10, 1976, which stated that the GSNCEP (SGCNPE 1976) should make an evaluation of the magnitude and consequences of the disaster on the economy, coordinating its activities with the army as well as helping in the negotiation and legalization of foreign loans.

Such negotiations are ordinarily a responsibility of the Ministry of Public Finances but in this case were carried on in coordination

with the GSNCEP and the Bank of Guatemala. The Mandate also mentioned that the GSNCEP had to coordinate international technical cooperation that had been offered by international organizations and friendly countries for the rehabilitation and reconstruction process, and finally, that the GSNCEP would make the necessary adjustments and modifications in the National Plan for Development 1975-1979 with the purpose of re-allocating and optimizing the resources that were needed for the rehabilitation and reconstruction programs. These two government institutions (the GSNCEP and the Bank of Guatemala) did the inventory of damages, estimated the economic losses in 1976 prices and included depreciation of the physical infrastructure that was destroyed. These institutions tried also to forecast the future general consequences for the economic development of Guatemala. Unfortunately they did not take into account inflation trends and therefore the reconstruction costs were underestimated. The data obtained under the circumstances were preliminary and partially reflected the magnitude and geographic extension of the disaster and the immediate needs of the people affected by the earthquake on a priority basis.

The GSNCEP also coordinated international technical cooperation, but the results of most of this massive foreign cooperation were theoretical, inappropriate, late, with little concern for Guatemalan indigenous cultures and sometimes also reflecting the lack of knowledge of some of the United Nations "experts" concerning rehabilitation and reconstruction programs. It seems that international technical cooperation through the GSNCEP was more a conceptual exercise preparatory

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	-	55.3	-
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 Guatemalan 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 $15^{\circ}32'$ North, Longitude $89^{\circ}08'W$ 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 "tembloreras") 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 competition 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 Guatemalan 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, Patzićia, 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, Ciudad 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, Godínez and Sololá as well as the sector from Godínez 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 those 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.

References

- Balcarcel, M. A. and O. R. Orellana
 1978 El Proceso de Reconstrucción de Guatemala. Ponencia del CRN al Simposio sobre el Terremoto de Guatemala, del 4 de Febrero y el Proceso de Reconstrucción. Comité de Reconstrucción Nacional, Guatemala.
- Bates, Frederick L., Charles D. Killian, Daniel G. Rodeheaver and Robert E. Klein, 1982 Emergency Food Programs Following the 1976 Guatemalan Earthquake: An Evaluation, The Guatemalan Earthquake Study, University of Georgia, Athens, Georgia.
- Bucknam, R. C. et al
 1978 Surface Faulting and Afterslip Along the Motagua Fault in Guatemala. Proceedings of the International Symposium on the February 4th, 1976 Guatemalan Earthquake and the Reconstruction Process, Guatemala.
- CRN, Comité de Reconstrucción Nacional.
 1977 Archivos de la Unidad de Información Sobre el Comité Nacional de Emergencia, Guatemala. (Folder sobre el Comité Nacional de Emergencia)
- Dengo, Gabriel
 1968 Estructura Geológica, Tectónica y Morfolgia de America Central: Mexico, Centro Regional de Ayuda Técnica, AID.
- de Ville de Goyet, C. et al.
 1976 El Terremoto de Guatemala Evaluación Epidemiológica de los Operaciones de Socorro. Boletín de la Oficina Panamericana. Vol. LXXXI, No. 3, Septiembre de 1976.
- Echeverria Vielman, J. G.
 1977 Ex-executive Director of the National Reconstruction Committee, 1977-1979. Personal Communication.
- Espinoza, A. F. et al.
 1976 Intensity Distribution and Source Parameters from Field Observations. The Guatemalan Earthquake of February 4, 1976, A Preliminary Report. U.S.G.S. Professional Paper 1002.
- Ferraté, Luis, et al.
 1976 Informe Final de la Comisión Ministerial para la Evaluación de los Daños Geomorfologicos y Hidrologicos derivados del Terremoto del 4 de Febrero de 1976. Ministerio de Agricultura - Abril - 1976 -, Guatemala. Sección Geomorfología.

- Ferraté, Luis and E. Klussman
 1978 Terremoto y Ecocidio. Simposio sobre el Terremoto de Guatemala, del 4 de Febrero y el Proceso de Reconstrucción. Comité de Reconstrucción Nacional, Guatemala.
- FOA, Food and Agricultural Organization, United Nations.
 1979 Production Year Book, Volume 32, 1978, New York.
- Harlow, David H.
 1976 Instrumentally Recorded Seismic Activity Prior to the Main Event. The Guatemalan Earthquake of February 4, 1976, A Preliminary Report. U.S.G.S. Professional Paper 1002.
- Harp, Edwin L. et al.
 1978 Earthquake-induced Landslides from the February 4th, 1976 Guatemalan Earthquake and their Implications for Landslide Hazard Reduction. Proceedings of the International Symposium on the February 4th, 1976 Guatemalan Earthquake and the Reconstruction Process, Guatemala.
- INSIVUMEH
 1976 Registros del Terremoto del 4 de Febrero de 1976. Archivo División Geofísica. Ministerio de Comunicaciones y Obras Publicas. Guatemala.
- Lunven, P. and Periseé
 1974 Energy and Protein Requirements; Their Use in Food Planning. Seminar on Agriculture, Planning and Population, held in St. Julians, Malta, 1974. FAO/UNEP Seminar. FAO/UN/TF - Int. 142 (UPA).
- Person, W., et al.
 1976 Main Event and Principal Aftershocks from Teleseismic Data. The Guatemalan Earthquake of February 4, 1976, A Preliminary Report. U.S.G.S. Professional Paper 1002.
- Rivera, M. H. and J. A. Serrano
 1976 Plan Nacional de Reconstrucción Urbana de Emergencia (Plan de los 100 Dias). Cámara Guatemalteca de la Construcción, Guatemala.
- SGCNPE, Secretaria General del Consejo Nacional de Planificación Económica - Banco de Guatemala.
 1976 Evaluación de los Daños Causados por el Terremoto, su Impacto Social sobre el Desarrollo Económico y Social y Lineamientos para un Programa Inmediato de Reconstrucción. Guatemala.

URF, Unidad de Reconstrucción Física, CRN.

1976 Estimaciones de la Ayuda Alamentaria Brindada por CONASUPO al Comité Nacional de Emergencia. Comité de Reconstrucción Nacional, Guatemala.

1977 Archivos Sobre la Reconstrucción y Rehabilitación de Carreteras y Caminos. Comité de Reconstrucción Nacional.

Urrutia, Claudio

1976 Director of the Institute of Seismology, Volcanology, Meteorology and Hydrology, Guatemala. Personal Communication.

Vassaux, P. J.

1969 Cincuenta Años de Sismología en Guatemala. Observatorio Nacional, Ministerio de Agricultura. Guatemala.

Chapter 4

The Origin of the National Reconstruction Committee and the Setting of Policy With Respect to the Reconstruction Process

Frederick L. Bates, Luis A. Ferraté and Robert E. Klein

Introduction

The NEC was a relief and emergency coordinating unit with limited manpower, scientific and technical support and with specific legal responsibilities that excluded it from the rehabilitation, reconstruction and development processes. Under the special circumstances created by the magnitude of the earthquake, the NEC nevertheless coordinated the rehabilitation of some services but the Guatemalan government realized that a new institutional structure was required to coordinate the massive reconstruction process that was needed to overcome the effects of the disaster. It was believed that highly bureaucratized governmental departments and the operational processes ordinarily used by these institutions could not cope with the consequences of such a massive disaster. A new conceptual framework, policies, mechanisms, actions and operational capacities were needed to reconstruct the infrastructure of the country. The knowledge, skills and imagination of top Guatemalan scientists with humanistic orientations backed up by field experience needed to be mobilized in order to crystalize the facts and define the basic needs of communities affected by the earthquake of February, 1976.

The NEC had been enriched by the ideas and proposed programs presented by the three main advisory groups discussed earlier. The group led by the Guatemalan Chamber of Construction, and some members of the National Economic Planning Council, saw the earthquake as a means to obtain a new definition of and new goals for the National Plan for Development for 1975-1979. This group proposed several relief alternatives to the NEC through the "100 Days Plan" and advocated the idea that BANVI and BANDESA should be the banks through which funds would be managed and housing programs would be financed.

The NEC, and later the NRC accepted these ideas. According to members of NRC, very positive results were eventually achieved through BANDESA but only fair results through BANVI. This latter institution was new and did not yet have the operational or institutional capabilities to carry on construction programs.

The second group, led by the GSNCEP and the Bank of Guatemala presented a series of economic concepts and general ideas about the rehabilitation and reconstruction process to the Guatemalan government. Most of these ideas were derived from the speeches given by the President of Guatemala and especially the first Executive Director of the NRC.

The President knew about the main guidelines stated in the programs presented by the aforementioned groups and also about other programs developed by the Army General Staff. He did not like any of them and asked General Ricardo Peralta-Mendez to analyze them and propose his own plan. The plan proposed by General Peralta-Mendez was accepted by the President and became policy for the reconstruction process. The

Guatemalan government and its institutions were informed about these plans and policies at the ceremonies inaugurating the NRC, when the President presented the general framework, and General Peralta, who had been appointed the Executive Director of NRC, discussed the concepts, policies, objectives and details of the reconstruction development process. This ceremony took place on March 18, 1976.

Other complementary concepts as important to the reconstruction process as those expressed on that date originated with Guatemalan field scientists who made up the third group formulating ideas about what was needed in the reconstruction process. These scientists were interviewed by the personnel of GSNCEP during the course of their preliminary inventory of the damages and economic consequences of the earthquake and their views became part of the information GSNCEP used in formulating plans. Other views of reconstruction came from medium level Guatemalan scientists and university scholars who worked during this period as part of the GSNCEP. These ideas were later incorporated in a second document presented by the GSNCEP to the President of Guatemala, and were as follows:

-Damages caused by the earthquake were mainly to the social sector and specifically to the poorest rural communities and urban slums. The economic gap between rich and poor could increase considerably because of the earthquake and therefore attention should be concentrated on poor communities during the reconstruction process.

- The earthquake had exposed the absolute poverty and deprived quality of life of poor communities, as well as their high levels of expectation. The reconstruction process offered a very good opportunity to improve the quality of human life in these communities by channeling those expectations into productive and effective community development programs. It was believed that the earthquake should be visualized as an instrument of change and a vehicle for the poor to obtain social and economic gains. Reconstruction was thought of as a mere mechanism or model to be used to develop the country by giving the communities a vital role in the planning, operational and action processes.

- The GSNCEP saw the earthquake as a means to make the goals of the National Plan for Development, 1975-1979 compatible with needs derived from the disaster and the reconstruction process. The reconstruction process was regarded as an opportunity to reformulate policies and to improve development. Unfortunately, although the GSNCEP incorporated into some of its early documents some of the ideas stated by the first Executive Director and by Guatemalan field scientists, it did not have the capacity to develop a comprehensive operational approach and attempted to achieve these rather complex goals using purely economic mechanisms. Eventually, the NRC placed pressure on the government to adjust these policies so that more appropriate methods related to the original goals could be used.

- The relocation and reconstruction of the physical infrastructure was seen as an opportunity to organize communities and to allow people to participate in the decision making process. Grass-roots planning and operational activities at the community level were advocated. It was believed that everyone should be responsible for his own destiny. Furthermore, it was believed that they would have to satisfy their levels of expectations gradually. Physical reconstruction was regarded as just the beginning of a long-term rural development process and as a by-product of community organization efforts. It was considered desirable that each community decide what their priorities were regarding their own development. It was believed that this designation of priorities would generate a cooperative effort that would result in community and not individual gains. The setting of priorities also would mean that a community decision-making process attuned to local culture would be established, and as a consequence, could result in the renewal of local values and the rejection of exotic ones.
- The reconstruction process was defined as being a responsibility of all Guatemalans. This concept was generated by the first Executive Director of the Reconstruction Committee and was one of the mottos used by the President of Guatemala to build national unity following the earthquake. Later, scientists of the NRC created other mottos in an attempt to build the high level of national cohesiveness that was needed during the first three years

of the reconstruction process. The idea that reconstruction was the people's responsibility was designed to create a positive feeling towards community participation. This willingness to cooperate at the community level was regarded as the most important positive psychological factor in the emergency, relief and reconstruction processes. Participation meant grass roots involvement and through it, new young leaders surfaced to participate in the decision-making process. As a result of this grass roots decision-making process, part of the distrust that Indian and peasant communities have always felt for the institutions of the Guatemalan government began to disappear and new channels of communications were opened.

- The idea of developing a sense of nationhood within a pluralistic society was like a hidden goal underlying the reconstruction process. Members of the National Reconstruction Committee report that these feelings increased up well into the second part of 1978. At this time changes in governmental policies concerning the concept of community development took place and feelings of mistrust returned and old social tensions emerged again.

- Another objective of this group was to use the system of agricultural and credit cooperatives to support the reconstruction process. Cooperatives were seen as ideal legal structures by which to introduce the ideas expressed above into communities. They were also seen as entities that could take the responsibility and handle the funding, technical assistance and other services

needed to speed up the community development processes. They also represented organized labor. They were rather fragile mechanisms to use in satisfying local expectations because consumerism processes had already taken root in them.

Cooperatives were also perceived as structures that could be legally controlled through the allocation of economic resources. This concept was generated by the demands of international banking systems that needed an operational structure that could guarantee their loans.

Later, as has been stated, all these ideas were integrated into a second and public document named, "Evaluación de los Daños Causados por el Terremoto, su impacto sobre el Desarrollo Económico y Social, y Lineamientos para un Programa Inmediato de Reconstrucción," published by the GSNCEP and the Bank of Guatemala in March-April, 1976 (SGCNPE 1976). The most important conclusions reached in this document and the guidelines presented in it represent the official government view and were a more detailed product of the speeches delivered on March 18, 1976 at the inauguration of the Reconstruction Committee. They are as follows:

- (1) The Guatemalan government did not have the capacity to cope with the problem. Governmental institutions were seen as being too inefficient and bureaucratized and staffed by low-paid technical personnel to handle the enormous task required for reconstruction. New institutions without the negative baggage of older ones were needed to conduct the reconstruction process.
- (2) The earthquake had not damaged the productive sector very much, as compared to the social infrastructure. One-sixth of the population was without shelter and without

urban services. Forty percent of the medical and health services, 25 percent of the educational services and 40 percent of the welfare services of the country were destroyed. This represented a 25 percent reduction in the housing stock of the country. To cope with the enormous economic problems associated with this loss, the Guatemalan government needed to increase the gross national product (GNP) from 6.4 percent in 1975 to 13.2 percent in 1976. It also needed to increase the economic investment coefficient from 14.5 percent of the GNP in 1975 to 23.4 percent in 1976. In addition it needed to increase the level of productivity of the construction industry threefold; and to increase the productivity of the industrial sector by 25 percent over 1975. It had to obtain immediately about 330 million dollars to be used in reconstruction in addition to the 625 million U. S. dollars needed for the National Plan for Development, 1975-1979.

(3) The earthquake could trigger an inflationary spiral and price speculation could occur due to the need to import more foreign products in order to repair damages and to increase the investments needed in the social sectors. It was recognized that as a final result of the crisis, the fiscal imbalance and disequilibrium could increase the economic vulnerability of Guatemala, in spite of its past history of adequate economic reserves and its good international credit rating.

To avoid these problems, the GSNCEP proposed that economic policies be centrally coordinated within the public sector in order to speed up negotiations with international banking institutions for needed funds. As correlaries of this broad analysis the economists of the GSNCEP proposed the following recommendations:

(a) The objectives of the National Plan for Development 1975-1979 and of the reconstruction and rehabilitation process should be made compatible. Funds for reconstruction should be in addition to the funds allocated for development in the period 1975-1979. It was recommended that agricultural and energy development projects be continued.

(b) The reconstruction process had to be seen as a mechanism to improve the infrastructure, productivity systems and the services of the country and not merely as an attempt to rebuild them as they were. The main efforts had to be carried out in the rural areas. Investments had to be decentralized to diffuse and to prevent further concentrations of urban population in Guatemala City.

(c) Grass roots participation in the decision-making at the community level and in construction and other action processes had to be sought. Through this participation the Guatemalan government needed to stimulate the creative capacity and initiative of the Guatemalan people. Local people had to be organized to obtain credit and be trained in self-construction practices. It recommended that local organizational mechanisms, cultural values and urbanization processes be respected.

(d) A powerful centralized institution needed to be created, with flexible and speedy mechanisms to initiate, control and coordinate the rehabilitation and reconstruction processes. Reconstruction should be understood as the responsibility of all Guatemalans and should be regarded as an internal effort. To achieve this goal of self-reliance, local organizational capacities of the communities had to be strengthened to a maximum degree.

While GSNCEP and the group centered around the Guatemalan Chamber of Construction, the National Planning Council, and BANVI were considering potential strategies for the reconstruction process emphasizing various institutional, economic and financing aspects, the group of Guatemalan scientists, some of whom had already been interviewed by the personnel of the GSNCEP, and members of NGOs helping communities in the field were concerned about the potential damage which could arise out of the rehabilitation and reconstruction process.

Most of the members of this group had academic training as well as field experience in rural integrated development programs and had shared experiences and knowledge with the affected communities for several years. The group consisted, not of desk type theoreticians, but thinkers and doers. Members of this group recognized immediately that the earthquake was, perhaps, one of the few opportunities that Guatemala would have to achieve social reforms in a peaceful and orderly way. Through some

of the Guatemalan scientists who had direct links to the NEC and to top Guatemalan officials these concepts reached the President of Guatemala and the Coordinator of the NEC as well as other government officers. The main concepts promoted by this group were as follows: They perceived that the earthquake exposed the fragility of Guatemalan institutions and the inequities of urban and rural life. It also dramatized the futility of most government development programs and revealed the increased levels of poverty and deterioration found in most Guatemalan communities. It was evident that a growing number of people were becoming poor, hungry, trapped in consumerism and in a degraded environment by previous "Plans of Development."

They noted, however, that the Guatemalan people, without outside direction, had reacted positively to a major disaster. They had picked themselves up and organized, and then assessed the local situation. The community leadership knew what should be done, what was needed and where to look for it. This group of field scientists felt that existing local capabilities developed the best mechanisms to cope with local situations and the Guatemalan government should cooperate to complement these indigenous capabilities and drives. The government needed to channel this organization potential into productive non-violent development activities and to establish mechanisms to increase these capabilities and drives.

The earthquake also exposed to the Guatemalan middle class and to the small wealthy minority the true human conditions of most of their fellow countrymen, especially in rural and urban slum communities. The

problems were on view for everyone to see. This included not only the national, but international community. A sympathetic feeling arose among the richer communities and countries. Food, clothing, supplies, medical attention, goods and services flooded in and a paternalistic approach to relief developed.

This group of scientists and technicians believed that the reconstruction process had to do away with paternalism, since the foundations of development were being negatively affected by what they saw as a sincere, honest, humanitarian, sometimes emotional and irrational give-away approach to relief.

This group recommended to the Guatemalan government that the rehabilitation and reconstruction processes discard the paternalistic approach which they believed was a source of human deterioration, social unrest and potential violence. Such an approach, according to their perceptions, would create dependence and above all, was open to the discriminatory influences and inequities associated with politics. Because persons affected by the earthquake belonged to a variety of political parties, ethnic and linguistic groups, economic and social strata and had different degrees of educational and technological experience, the NRC had to cooperate with everybody.

According to this group of scientists and technicians, the main goal of reconstruction should be the improvement of the quality of human life in a peaceful way through a harmonious development and reconstruction process. The best instrument to achieve this goal was believed to be grass roots organization which would involve the people's participation in the decision making process and in planning actions and executing the

reconstruction process.

It was considered essential to develop a sense of community at the national, local and family level in order to unite Guatemalan society as well as to decrease the gap between rich and poor. The final product of such a process could be not only social and economic development but the sharing of an inter-cultural process that might bring about needed social and economic changes by peaceful rather than by violent means. The reconstruction process opened the door for major peaceful evolutionary changes which could, if successful, close the door to a violent revolution and terrorism, the methods which had always accompanied change throughout the Central American region in the past.

Through the reconstruction process the scientists and technicians believed cultural and environmental approaches to the relationship between man and nature and man and society could be introduced. This group believed that Guatemala could not develop if its institutions, laws, human resources, wealth distribution and other socioeconomic characteristics were not discussed, analyzed and revised. The reconstruction process could open a true dialogue between the Guatemalan government, different interest groups, communities and other groups based on region, ethnicity, wealth and power.

During the first three years the NRC did, in fact, open a dialogue and for the first time in Guatemalan history, poor rural and urban communities and neighborhoods expressed their feelings, expectations, convictions and basic needs to the Guatemalan government without fear.

While this dialogue went on the reconstruction process was also concerned with the physical geography of the country. The scientific-technical group believed that no development could take place in the long run if the soils, water, vegetation and other geomorphological resources were degraded or extinguished. Therefore it was believed that every reconstruction project should optimize the development reconstruction process on the basis of two variables. One, natural resources should be used on a perpetual or renewable basis and the other, any project should bring about as much permanent social and economic gain as possible. The relationship between man and nature should be not only technologically and socially efficient but effective in terms of bringing to the communities advances in their quality of life. As a by-product, communities needed to rediscover their own skills, knowledge and wisdom and be proud of the appropriate technology embedded in their culture. This could yield self-sufficiency, and self-reliance by promoting use of local materials.

This group believed that the reconstruction process should also stress the relationship between man and society. Any human being needs to satisfy his basic biological rights to survive; the right to breathe and exist, to eat nutritious foods, to have adequate shelter and clothing, to exercise and recreate and to have security and the freedom to move about his environment. If a person does not satisfy these biological and social needs, he or she can not develop and therefore improve their relationship to nature and to society. It is believed, however, that these biological and social rights were only the starting point to achieve

"development rights." Development rights were visualized as the opportunities that any person has to be educated, trained, and be able to work, to participate in all sectors of society and to seek self-expression and self-realization. It was also believed that these rights should be extended to women and children who should have the same opportunities that men have to attain these goals.

The last recommendation of this scientific technical group concerned consumerism and dependence. The reconstruction process, according to this group, could bring to rural communities and urban slums a better quality of life, greater income and an increase in the cash flow. The economic increases should be invested in social gains and not in increasing consumerism which emphasizes industrialized and imported goods. Rural communities should rely on their own resources and try to avoid dependence on exotic innovations brought in by outsiders.

Outsiders tend to view local disaster and development problems in quantitative, analytical, rational terms and to express local requirements, needs and solutions in numbers which will assist them in obtaining funding and other support from their sponsors. In contrast, insiders view problems in more qualitative and historic terms. Locals are concerned with cultural disruption, appropriate technology, ecological diversity and long-term goals and achievements and understand more of the consequences of consumerism and dependence. Therefore reconstruction-development projects should be controlled by insiders, or by Guatemalans or foreigners intimately familiar with local conditions.

While these three Guatemalan groups (the 100 Days Plan Group, the GSNCEP and the scientific-technical group) were offering advice and

recommending solutions, and even sometimes demanding action from top Guatemalan governmental decision makers, another group formed by Guatemalan and international private voluntary organizations met first with AID and U.S. Embassy officials and later with the United National Development Program (UNDP) directors. The original idea of these meetings was to coordinate private emergency relief and rehabilitation operations and to avoid overlapping in operational activities, the diffusion of resources and, above all, to try to find a common approach to reconstruction problems. Representatives of the NEC participated in these meetings but did not have the experience and capacities to coordinate non-governmental organizations (NGOs) and their programs.

The numerous NGOs involved in disaster relief and reconstruction had different and varied goals and concepts concerning relief, rehabilitation and reconstruction. They also varied tremendously in operational capacities. Rather than attempting to manage the work of NGOs in detail, the NEC assigned them a geographical area in which to develop their programs and left them alone to manage their own affairs.

This decision was later regarded as a good one by the NRC but various voluntary organizations disagreed conceptually. Some wanted to work at the grass roots level, with anti-paternalistic approaches using local community networks to perform reconstruction programs and others wanted to be paternalistic, use foreign technicians and exotic supplies to carry out their programs, and to give their aid away to disaster victims without requiring them to participate in their own recovery. Many also wanted to receive recognition through the media in order to

bolster contributions from their donors. This division between NGOs created problems for the NEC and for communities that, in some cases, became "experimental grounds" for "pilot projects."

More than 210 NGOs and other private groups operated in Guatemala after the earthquake but only about half of them were registered at the NEC and some confusion arose. For example, some of the larger NGOs proceeded to develop reconstruction policies of their own without consultation with the NEC. Such policy decisions were supposed to be the prerogative of the Guatemalan government. Some of the emerging independent non-governmental policies were regarded as being unduly paternalistic by the NEC and as promoting dependency and consumerism. Later, the NRC used its power to attempt to correct them.

The Relationship Between the NEC and the NRC

The NEC did an outstanding job in the impact, emergency, relief and early rehabilitation operations but did not have the legal, technical and operational capacity to coordinate the total reconstruction process in Guatemala. The Guatemalan government, especially the President and General Coordinator of the NEC, realized this, and relying on the conceptual inputs from the three national level groups discussed above, decided to create the National Reconstruction Committee (NRC). This institution absorbed the rehabilitation programs of the NEC, and was assigned responsibility for coordinating, supervising and controlling all of the reconstruction-development projects that needed to be carried out. The NEC was glad to be relieved of these programs. However, with

these already on-going reconstruction programs, the NRC inherited a series of problems and along with them, a power struggle which was going on to control the reconstruction process.

Circumstances of the Transition from the Emergency
to the Reconstruction Committee

The GSNCEP wanted the NRC to depend on its manpower and to adopt its decisions, thereby behaving as an "economic development unit." The private sector visualized the reconstruction process and the NRC as a means to obtain large profitable construction contracts to rehabilitate the infrastructure and at the same time, a legalized relationship to NGOs as an institutional base for their operations in the area affected by the earthquake. The army saw the reconstruction process as a means of improving its image. Still other power groups wanted personal gains from the NRC.

Fortunately, the President of Guatemala named an able senior army officer as the first Executive Director and two other top government civilian officers who were related to the private sector and to the cooperative systems. These officials had high credibility with the public and good administrative credentials.

The most important decision was made at the operational and conceptual levels. The President of Guatemala, but especially the Executive Director of the NRC, decided to name experienced army officers and Guatemalan civilian scientists with courage, charisma and excellent working records as coordinators of the various programs within the NRC. These persons had field experience and some belonged to the group of scientific and technical experts who had been advising the NEC. Members of this group formed the core of the NRC. In addition to this group of

coordinators, other army officers and high level, cool-headed Guatemalan government professionals were transferred to the NRC to advise and support the committee's coordination activities. Without any doubt, most of the personnel that initially formed the NRC were among the best persons the government could find. These choices created an entity with large scientifically based decision making and operational capacities which enabled the committee to respond positively to the development needs of rural communities.

With the creation of the NRC, the NEC returned to relief and emergency operations and left all the rehabilitation and reconstruction responsibilities to the NRC. These institutions complemented each other with supporting activities and very few transitional problems arose.

Soon after the formation of the NRC, problems began to develop for it, but they were not between it and the NEC. The resourcefulness of the people in stricken communities and on the part of some of the personnel of the NRC in initiating reconstruction programs caused jealousy among regular government bureaucrats who saw themselves as being ignored. Problems also arose in relations between the committee and a few economic planners. Top officials, even ministers, tried to undercut the policies of the NRC. To these bureaucrats and politicians, the NRC was an emerging political force that interfered with their personal or partisan goals. As a consequence, they wanted to control it. The best way to do this was to discredit and defame the NRC staff. In this process an internal struggle arose within the government in the months following the earthquake. According to some NRC personnel, an attempt was made to create an impression of corruption and the mismanagement of funds by the

top leaders of the NRC, even though they never directly managed funds. These accusations were eventually discredited.

The NRC became the spokesman for rural Guatemalan communities and for the poor and carried out this role from 1976 to the beginning of 1979. Soon after its formation, the NRC became a threat to the regular governmental bureaucracy which was comprised of what many committee members saw as inefficient government institutions. It was especially disliked by desk planners and by ultra-conservative sectors of Guatemalan society as well as the extreme left. All of these groups believed that it should be neutralized, restructured, and redefined in order to transform it into a "normal" government entity. These were the most important circumstances under which the transition from emergency to reconstruction took place. As the reconstruction process progressed, and this power struggle continued, the original technical staff of the NRC was replaced by a largely political staff and its role as spokesman for the rural poor was weakened.

The Organization and Responsibilities of the NRC as Contrasted to the NEC

The Guatemalan government has close to 174 different institutions to carry out its executive, legislative and judicial actions designed to organize, develop and control the country. The majority of these governmental bureaus depend directly on the Presidency and its Ministries of State and are highly bureaucratized, relatively inefficient and outdated. Many Guatemalans interested in development believe that without any doubt the governmental bureaucracy is the most effective Guatemalan system against development.

The NRC, because of these circumstances, decided that it could not be part of it. Instead, it attempted to become an institution with the freedom to operate autonomously and to make quick decisions that would increase development effectiveness. Due to the special circumstances of the earthquake and its consequences, a coordinating and supervising entity was needed, with enough support, power and authority to speed up and control reconstruction projects being carried out by government institutions and private organizations. As a result of Presidential decisions, the NRC became the highest authority in the reconstruction process within the earthquake area, especially with respect to the coordination of Guatemalan governmental efforts.

The Guatemalan government wanted to create a temporary, and not a permanent, institution. It was estimated that the reconstruction process would be finished in 10 to 12 years. During that period it was hoped that the NRC would create a new attitude and mentality in the bureaucrats making up the regular ministries of the Guatemalan government.

The creation of a temporary entity seemed to be the easiest solution in 1976 because it would not alter the basic institutional structure of the government. To change that structure would have required the laws and regulations that govern them to be changed. The idea of the President of Guatemala, based upon the concepts and logic of the document prepared by the first Executive Director of the NRC, was to complement the operational capacity of the Guatemalan government with a flexible coordinating institutional superstructure and to furnish the necessary supporting laws, personnel and authority. He did not wish to create more

bureaucracy and therefore the personnel to constitute the NRC were lent by the existing institutions.

The NRC was created on March 18, 1976 by the President of Guatemala and his ministers based on Paragraphs 4 and 34 of Article 189 of the Guatemalan constitution. A government decree was published stating the following reasons for its creation (UI,CRN 1977):

- The earthquake of February, 1976 caused a major national disaster affecting human lives, housing, economic and social structures and the productive sector.
- The dimension of the damage is great and the Guatemalan government needs to coordinate the rehabilitation and reconstruction efforts with the most important and fundamental actions for the social and economic development of the country, as they are considered in the National Plan for Development 1975-1979.
- The actions of the Guatemalan government need to be channeled in effective ways in order that the different programs and projects carried out by executive units (of the C.G.) are coherent, satisfying the objectives of reconstruction as well as the national ones stated in the above mentioned plan.
- The Guatemalan constitution delegates to the President of the Republic (Guatemala) the functional coordination of the actions of the Ministries of State. To make this coordination more effective between the Ministries of State and the other government institutions during the reconstruction process, it is

necessary to dictate complementary measures to improve and make more effective the coordination.

The general structure, organization and operational functions of the NRC are stated in that decree and interpreted and condensed as follows:

- Article 1 = The NRC is created as the executive organism of national reconstruction policies and the President of Guatemala will define the general guidelines, objectives, priorities and mechanisms.
- Article 2 = The NRC will be presided over by the President of Guatemala and will be comprised of:
 - a - An army representative who will be an officer with the rank of general on active duty. This person will exercise his functions as the Executive Director of the NRC in representation of the President of Guatemala.
 - b - A Minister of State, as a coordinator of the NRC.
 - c - A representative of the cooperative movement, as a link with the cooperative systems and the communities.
- Article 3 = The NRC obligations are:
 - a - To approve, develop and execute reconstruction programs.
 - b - To direct and coordinate all the actions of the Ministries of State and other government institutions that are carrying out approved plans and programs, making sure that these plans and programs are executed in the scheduled time using established procedures.

c - To promote the voluntary participation of the non-governmental sectors, social services entities and other international assistance organisms; determining the aspects and areas of their participation as well as the operational regulations and other attributions.

- Article 4 = All government institutions and decentralized entities are obliged to supply to the NRC the help and cooperation requested by it (by the NRC). Particularly, the Ministries of State will accomplish and will facilitate the accomplishment of the decrees and directives of the NRC, regarding reconstruction plans and programs.

- Article 5 = The technical and administrative personnel that the NRC requires, as well as other facilities and services that are needed to exercise its functions, will be supplied by the Ministries of State, Secretaries of the Presidency, decentralized entities and other public institutions, charging the expenses to their ordinary budgets. The non-government entities that are collaborating voluntarily with the NRC will cover their own expenses in the operations that they will perform.

- Article 6 = The NRC will designate specific consultant and advisory commissions that could be comprised of government officers and public employees of any category in order to develop the studies, recommendations, projects or plans needed for the reconstruction process.

- Article 7 = All public and decentralized entities, autonomous or semi-autonomous, which are required by the NRC, will designate

one of their top officers or employees to become the coordinating element between their entities and the NRC and they are in charge of carrying out and accomplishing the orders given to their entities.

- Article 8 = All appointments for positions within the NRC will be made by the President of Guatemala and the jobs will be performed ad-honorem.

- Article 9 = All the documents used by the NRC will be collected in order to create a data bank and a reference to establish the ideal mechanisms to cope with future catastrophes.

- Article 10 = The NRC will operate and function as long as the President of Guatemala considers it a necessary entity for the reconstruction process.

Structurally the NRC operated in the following way. The President of Guatemala delegated his authority to the Executive Director who was second in command of the committee. To speed up and improve coordination within the government, the Minister of Public Finances was named in 1976 to the third ranking position, that of Coordinator of the NRC. This nomination was necessary because that Ministry manages ordinary and reconstruction budgets and makes decisions about the allocation of funds to other government institutions. Through that Ministry the NRC would also obtain the support of the GSNCEP - Bank of Guatemala. This support was needed for economic planning and for the funding of the community development projects.

The fourth ranking member of the committee was the Representative of the Cooperative Systems. This person was the Vice-president of the

National Bank for Agrarian Development (BANDESA) in 1976 and had strong ties with the rural cooperatives and communities and through them could channel funds, technologies and reconstruction goals.

These four officials formed the power base and top authority structure of the NRC and produced the decrees and directives under which the committee operated. Due to their positions, the NRC was a super governmental structure, well conceived and well designed.

Within the NRC and providing the operational, functional, scientific, technical, conceptual and logistic support to these authorities there were two secretariats. One, the General Secretariat, was in charge of the administration and coordination of all the functional and operational systems of the NRC and it was supported by six units that were assigned specific coordination and supervision activities. The first one was the Planning, Programming and Information Unit (originally Information Unit) - PPIU. It coordinated planning, programming and evaluation procedures for reconstruction operations and collected, analyzed and corrected the data that was needed to measure the progress of reconstruction projects. Other activities performed by the PPIU were the coordination of urban community development projects in Guacemala City carried out by BANVI, the provision of guidelines for urban land use and zoning in reconstruction schemes, the production of annual reports to provide information to the public and the keeping of a detailed register of the construction time schedule and monetary investment of every reconstruction project. It coordinated reconstruction activities with the GSNCEP and the Bank of Guatemala in order to keep the Executive Director informed on the progress of the reconstruction process and to recommend which measures

should be taken to improve the operational capacity of the Guatemalan government. This unit also prepared the annual budget request for NRC operations and personnel.

The second operational unit of the reconstruction committee was called the Physical Reconstruction Unit (PRU). Its original functions were the coordination and supervision of all construction programs and projects carried out by the Guatemalan government and its executive entities. Other initial activities were the preparation of technical documents to improve the reconstruction process as well as the provision of technical field supervision by architects and engineers of structures being built. It was also expected to advise on community development.

During the first two and a half years this unit worked very productively in spite of serious political confrontations. It coordinated and supervised most of the reconstruction programs in the field and induced other government institutions to improve their ability to build infrastructure facilities and services. It also demonstrated the qualitative and quantitative differences in construction and administrative costs that existed between the government and NGOs. The publication of this information resulted in a negative reaction against that unit since it reported that government costs were up to three times higher for the similar types of infrastructure - houses, hospitals, roads, bridges, etc. than those of NGOs. The NRC costs for construction were similar to the ones of the NGO. When these facts became known, the PRU tried to lower government costs, most of which were due to bureaucracy.

This unit was also in charge of controlling the distribution of construction materials produced in Guatemala. In spite of the scarcity,

it managed to keep the flow of materials into the reconstruction process going. Unfortunately, this was done quantitatively and not qualitatively due to the lack of national regulations for construction materials. The responsibility for such standards lay with the Guatemalan Commission of Regulations (COGUANOR) but this Commission had not done so. Later in the reconstruction process (1979) control over construction materials was transferred to the Army Secretariat.

The PRU faced its biggest reconstruction and technical problems during 1976, 1977 and 1978. There were no technical regulations or codes for land use zoning, construction processes or for quality standards for construction materials. The GSNCEP did not even have a scheme for territorial zoning or a model for spatial occupancy in Guatemala for different time scenarios. There was no rational plan for reconstruction or development. Because of the lack of cooperation from other Governmental institutions, the NRC decided to perform six studies through the PRU as a basis for reconstruction and development planning. These studies were sent to the National Council for Economic Development for approval and most of them "were lost." The studies were titled:

- "Ecological Indicators for Spatial Occupation with Special Emphasis to Urban-Rural Settlements," by Dr. Luis A. Ferraté.
- "Guidelines for a Land Acquisition Policy for Human Settlements at a National Level," by Dr. Gustavo Gaitán and Lic. Victor Ramirez.
- "Seismic Risk Plan," by personnel of P.R.U.
- "Construction and Proposals for Prefabricated Houses," by personnel of P.R.U.
- "Quality Control Regulations and Standards for Building Materials," by Ing. Emilio Beltranena and Arq. Zoemia Prado.

- "A Guatemalan Typology for Housing," by Arq. Zoemia Prado and Dr. Luis Ferraté.

Unfortunately, most of these studies were lost somewhere in the bureaucracy and the few copies that survived at the NRC were not used because legal approval was needed. These studies were finished in late 1977, but aroused a high degree of animosity among some of the Ministries of State toward the NRC. Indirectly, the documents exposed the inefficiency of some Guatemalan bureaucrats and this fact aroused the anger of the Ministries affected.

The PRU was substantially reduced after 1979 and was left with very few technical personnel. After that it only coordinated activities and exercised general field supervision over the construction of infrastructure carried out by Guatemalan institutions and by the Military Secretariat.

The third unit of the reconstruction committee was called the Social Promotion Unit (SPU). It was in charge of the organization and coordination of local reconstruction committees in urban and rural areas, as well as the compiling of an inventory of basic services in cooperation with local communities. It was also charged with evaluating the impact of reconstruction projects on the development of communities. It was supposed to promote technological and social solutions to problems that would not create social disruption, but due to its low technological and conceptual capacities, this was not possible. It was the largest unit of the committee, divided in two sub-units - Metropolitan Area of Guatemala City and the Urban-Rural Unit. From the beginning it was coordinated by army officers who did an excellent job and fought against

the politicization of this unit.

The SPU performed an outstanding job during 1976 and 1977, but after 1978, with the change of government and a shift in specific political and sectarian interests, this unit became partially politicized and the reconstruction process lost a certain amount of credibility and confidence. In late 1978, the Guatemalan government replaced the technical staff of this unit by non-qualified persons, introducing "political participation." In spite of the efforts of the army officers coordinating this unit, it gradually fell apart, causing more problems than benefits to the NRC. The unqualified staff members eventually placed in this unit represented different political parties and different philosophies of reconstruction. For these reasons, internal attrition increased after 1979 and most of the technical and scientific staff of the committee left or were forced to leave the NRC. The scientists and technicians who left the NRC had no particular political interests or participation. According to early members of the NRC these scientists were the ones that brought charisma and credibility to the committee on an international level.

It is worth stressing that all the army coordinators of this unit were non-political and made sincere efforts to correct the internal situation. The NRC, however, did not seem to have the political or real power to stop the politicization in this unit and the erosion of the NRC credibility after 1978.

The Social Promotion Unit, in spite of its problems, achieved certain successes, nevertheless. In 1979, 1980 and 1981, with the cooperation of other entities, it moved about 16,000 families from

refugee camps and "settlements" to permanent housing projects and urbanized lots in Guatemala City. This is believed to be the largest voluntary movement of families in Central America. There were no severe problems associated with this move because families looked forward to developing the houses and urbanized lots they received.

In 1976-1977, the same unit also organized 1,533 local reconstruction committees, 63 municipal committees and four departmental ones. Through most of these committees, the SPU tried to teach construction techniques, organize programs to obtain basic services, and to promote local technologies, and to obtain labor and materials.

The fourth operational unit of the NRC was called the Public Relations Unit. This unit was supposed to coordinate public relations and media services. It did not, however, have the funding and the motivation to do its job. In some respects it was a failure and in others, a success. It was a failure because the enormous efforts and operational actions of the NRC remained unknown or were distorted through outside media perception. It was a success because the NRC, due to its lack of activity, maintained a low profile most of the time. As a consequence it did not challenge other Guatemalan institutions who reported their work through vast media propaganda programs. This unit did keep records of the public inauguration ceremonies for NRC projects and of the social-political events related to the reconstruction process.

The fifth operational unit (URPAC) was designed for the coordination of projects aimed towards the preservation of the cultural

patrimony of the country. Its main objective was to search out and rescue cultural artifacts of historical significance that were under the rubble or lost during the earthquake and to reconstruct indigenous, colonial or any other monument with cultural value. This unit was under the Ministry of Education, but attached itself to the NRC due to lack of support, funds and authority from the Ministry. Its personnel were excellent and did very good salvage and restoration work within funding limitations. It was absorbed by the Institute of Anthropology and History in 1980.

The sixth unit of the National Reconstruction Committee was called the National and International Cooperation Unit (NICU) and inherited the supervision of some of the NGO programs initiated by the NEC in 1976. Its job was to promote and coordinate reconstruction and development programs and projects carried out by non-government organizations, private voluntary organizations and other entities of the private sector in rural areas and in some slums of Guatemala City.

It also provided institutional support and services to NGOs in the field of customs clearance and money exchange. It did the paper work for importing equipment and machinery for the reconstruction processes duty-free.

After 1976, this unit coordinated approximately 165 agreements and addenda that represented the reconstruction, rehabilitation or economic support for about 16 temporary housing projects (approximately 29,699 units); 39 school projects (554 units); 36 medical and health projects (241 health centers, posts and medical clinics); 34 infrastructure

and service projects (498 potable water systems, drainage-sewage systems, community centers, child care centers, dental clinics, libraries, museums, warehouses, "pilas," roads, churches and other services); 661 programs for community development, self-construction, food and nutrition, family planning, home economics, agricultural and natural resources management and finally, 29 programs of building materials distribution and other services (Balcarcel et al 1978).

This unit was also responsible for maintaining good relations with all national and international NGOs and for staying in close contact with relevant embassies, consulates and service clubs. The original idea behind the NICU was to provide services to facilitate the administrative functions and field operations of NGOs and to establish guidelines to minimize unnecessary cultural disruption. Preventing cultural disruption was understood as prevention of the introduction of innovations that might cause severe negative social, economic and environmental changes, or increase consumerism and dependence, without producing development or satisfying basic needs.

The NICU, due to its unique function, developed such strong ties with foreign and Guatemalan NGOs that it became a kind of "credibility center" for the NRC from 1976 to 1980. Some of its coordinators and staff had several years of field experience in rural development projects, natural resources management and agricultural improvement, and in the use of appropriate technology. From 1976 to the beginning of 1980, the NICU coordinated the largest reconstruction and development projects carried out by non-government organizations and became the conceptual think-tank for rural community development in Guatemala.

Although it was the smallest unit in the NRC, at least 40 percent of the rehabilitation and reconstruction of community services and infrastructure was accomplished through its coordination (Ferraté et al 1978).

Under the General Secretariat in 1976-1977, another unit existed. It was called the Evaluation and Control Unit but it was soon absorbed by the Information Unit and later by the PPIU. The NRC also contained a Military Secretariat in its structure. Its duty was to coordinate communication and transportation activities, customs and import mechanisms, security, relations with the army, logistic support, equipment, vehicles and machinery and to manage a minimum amount of funds for emergency works and supplies. It was also in charge of all the NRC distribution programs of building materials, foods and other goods. It was managed exclusively by senior army officers and complemented the administrative and operational functions of the General Secretariat.

There were four sections that supported the activities of the Military Secretariat. One was the Engineering Section which dealt with the opening of secondary and tertiary roads, general urbanization and other engineering works and sometimes, with the establishment of refugee camps. There was also a Customs Section in charge of facilitating paper work in governmental offices, especially in customs, to arrange duty free import activities, mainly for the NGOs.

The third section of the Military Secretariat was in charge of transportation, vehicles, fuels, garages, warehouses and all activities related to the logistic support of the NGOs. The fourth section was a special office that dealt with security, performing special activities.

There are two other offices that depended on both secretariats. One was the Personnel Office with control responsibilities for the administrative and clerical personnel of the NRC, and the other was the Internal Accounting Office which dealt with the control of the small amount of money that was managed by the NRC, especially the money controlled by the Military Secretariat. This Secretariat collected funds derived from the distribution of building materials at a subsidized price. It also received some government allocations.

The NRC was supported, on paper and by law, by all Guatemalan governmental institutions but it had strong real support from BANDESA, and BANVI, especially during 1976, 1977 and 1978. It also received strong support from the National Financing Corporation, CORFINA, the banking system, especially the Bank of Guatemala, INFOM and the cooperative movement during 1976, 1977, 1978 and part of 1979. After 1979, its support diminished due to political considerations and changes in government policies.

The NRC had a total of about 220 people employed in its work in 1976, but by 1981 had decreased to about 160. The largest group of people were in the SPU - about 52 percent; next came the Army Secretariat and its supporting officers - approximately 15 percent; the PPIU - eight percent; the PRU - some six percent; the UNIC - four percent and other offices - about 15 percent.

Before leaving the topic of NRC organization it should be noted that in order to decentralize development plans and to improve efficiency and effectiveness and to give priority to programs for the

poor, the NRC promoted several departmental coordinating offices - with the respective Departmental governors in charge of them.

Policies, Objectives and Mechanisms Developed by the Guatemalan Government
to Carry Out the Reconstruction Process

As a new organization starting after some early work had been done on reconstruction planning, the NRC had to be eclectic. It therefore accepted some of the guidelines already formulated by different institutions and individuals. It assembled an interdisciplinary team of experienced Guatemalan field scientists, well respected managers, army officers and professionals hand picked by the first Executive Director. This team transformed these early guidelines into pragmatic policies, strategies and mechanisms designed to benefit the people affected by the earthquake, especially those living in rural and depressed urban communities.

The NRC could not follow the Guatemalan government's historic patterns of development. The result of previous National Development Plans was perceived by this committee as economic growth at the expense of socioeconomic degradation, producing severe and unneeded cultural disruption and biological deterioration. For several years indicators of economic growth had shown an increase in the GNP and in the output of agro exports - coffee, cotton, sugar, beef, banana, cardamon and other products. These indicators also showed a steady increase in industrial productivity, tourism and trade and an economic expansion of exploitation of non-renewable natural resources such as minerals and

petroleum. Economic data also revealed expansion in the number and size of transnational companies and other sources demonstrated their increasing influence in government decision-making processes and actions. Finally, various indicators revealed an increasing economic gap between the poor and the rich in both the qualitative and quantitative sense.

Other indicators of social degradation, severe and unneeded cultural disruption and biological deterioration showed a very severe nationwide situation. The NRC compiled some information that describes the 1975 conditions of Guatemala as follows (Balcarcel et al 1978): There was a housing deficit of approximately 500,000 units before 1976 and this deficit was increasing sharply. Some 1,355,000 children were not attending school, about 22 percent of the total school age population of the country. Only 12 percent of the rural and 40 percent of the urban population had potable water connections. The infant mortality rate was calculated to be between 80 and 200 deaths for every 1,000 children born, depending on community, and life expectancy averaged 53 years. Other indicators showed not a community development process, but one of deterioration and stagnation.

At the natural resources level the picture was darker. A document used by university students in the Department of Engineering, University of San Carlos (Ferraté 1979), stated that approximately 50 percent of the renewable natural resource base of Guatemala was degraded and that it was decreasing sharply. About 70 percent of the water and land resources were contaminated to different degrees. It stated also that

67 percent of the total area of the country had erosion losses, increasing run-off and solution processes of about 12 metric tons per hectare per year, amounting to some 70,000 square kilometers. These problems were especially severe on the southern coastal plain and in areas of pumice grabens. Between 63 and 67 percent of the original vegetation had been cut, burned or replaced by inappropriate vegetation and, as a consequence, the country, as a geomorphic unit had been increasingly exposed to hazards and risks derived from environmental events or other natural phenomena. The country had been made vulnerable by man-made processes that had decapitalized the country and lowered its natural environmental resistance.

The NRC also believed that the "models of development" used in the past had created a very dangerous power structure that was responsible for the increased level of violence in the country and for retarding development. The only people benefitting from these circumstances and events were at the political extremes, and a number of scientists on the Committee believed that a violent confrontation could be expected between these extremes in the next few years. These thoughts were brought up for consideration by the top authorities of the NRC and these authorities began to realize that the Guatemalan government had been ill advised in the past by bureaucrats, with little field experience and a lack of direct knowledge of the socioeconomic realities and the political situation that the earthquake had exposed. These top authorities decided that development programs of the reconstruction process should not just complement, and in some instances restructure the programs and

projects of the National Plan for Development 1975-1979, but introduce new basic concepts that would emphasize community development and the conservation of natural resources.

Everyone at the NRC realized that the reconstruction process presented a unique opportunity to make economic growth compatible with social, biological and political needs and to optimize the use of the natural, technological and institutional resources of the country.

Members of the committee were not naive, but knew at the beginning that efforts to curtail the activities of the NRC were taking place at different political levels. They had shown top decision makers that Guatemala's economic growth and "development" was going on at the expense of cultural disruption and the social degradation of low income communities and that it was leading to the deterioration of the natural resources. As a result, a potential confrontation between the extreme left and right might be forthcoming. The scientific staff and the top authorities of the NRC had a very deep concern about the potential for violence stemming from these problems.

In order to avoid violence, the reconstruction process should have a new conceptual framework to help overcome socioeconomic inequities and try to improve the natural resources base. The task of accomplishing this was difficult and delicate due to the lack of public confidence in past Guatemalan government programs. This lack of confidence stemmed from the fact that most such programs were based on very large economic investments in high technology with little social meaning and grass roots impact. As a consequence, rural communities mistrusted most

government programs. Since the NRC was an arm of the government, it could inherit this distrust.

By the end of March, 1976, the conceptual framework discussed above developed into a "reconstruction-development" philosophy. The central theme of this philosophy was to attempt to adjust the cultural order to the natural order, and as a result of this adjustment, create a peaceful, evolving, continuous and expanding development process. This reconstruction-development philosophy was stated through the published intentions and purposes of the NRC. The philosophy was converted into operating policy through the following guidelines:

- The organization and participation of communities at the grass roots level is considered mandatory in order to obtain a decision-making process which proceeds from the bottom to the top, establishing different responsibilities at each level of participation and, at the same time, enhancing the cultural interchange among levels.
- The satisfaction of the different levels of social, economic and biological expectations of the communities has to be accomplished mainly through the use of their own appropriate technology, local labor and materials and not by the use of outside innovations that might cause severe and unneeded social disruption or degradation.
- The development of community self-confidence, self-reliance and self-expression has to be promoted in order to reject patterns of dependency, paternalism and consumerism and to enhance the communities' own working capacity and

imagination and thereby to create integrated development.

- The NRC should try to promote a better relationship between man and nature through the balanced use of natural resources, the improvement of management techniques and the increase of natural productivity. It should also encourage conservation activities that permit the use of physical and biological energy in the reconstruction process and in the agricultural-pecuarian-forestry systems.

- The reconstruction process should encourage emphasis on goods, services and commodities that are available locally and not on exotic goods. Paternalistic temporary programs should be discouraged. The reconstruction process should be regarded as development of a means to stimulate and promote improvement of social organization and the increase of participation in the country's development process.

- The NRC understands that the cultural heritage of the country was and is an expression of the traditional value codes of the society and it should try to restore national monuments not only as a means to preserve those expressions of culture, but to stimulate growth of new ones.

- International and national private cooperation, aid and other assistance should be understood as an intercultural effort to improve the quality of life of depressed rural and urban communities and not as a means to introduce innovations or other exotic diffusion patterns that could create severe and

unnneeded cultural disruption. International and national private cooperation and related activities are perceived and understood as a unique opportunity to share technologies, attitudes, development models, value codes and culture in a direct way, without government, political or economic interests intervening, but on a person-to-person basis. Therefore the NRC has to become a general forum to discuss and coordinate the activities that the NGOs need to perform in the reconstruction process.

- The NRC should promote and establish the necessary mechanisms to assure a continuous flow of building materials, technical and qualified labor and banking-financing systems to speed up development programs being carried out as part of the reconstruction process.

- The NRC wants to become a link between different social and cultural groups that form the structure of Guatemalan society. It is one of the original goals of the NRC to develop a feeling of nationhood through the NRC and also to become a kind of open forum to establish a dialogue between the communities, the Guatemalan government and the private sector.

Some of these original goals of the NRC were lost with the political problems that the NRC had in 1978 due to the participation of its four top leaders in political campaigns, but the dialogue continued until 1980, when political violence increased and communities started losing faith in the NRC.

These policy objectives needed to be supported by practical mechanisms. The Guatemalan government had created an institutional, philosophical and political framework for the NRC and supplied it with a good scientific and coordinating staff that created a more detailed conceptual and philosophical framework and more specific policy objectives. These needed to be crystalized into operational realities through strategies and practical mechanisms that could be sent into the field. These practical mechanisms needed to take into consideration the social, political, economic and ecological problems that the Guatemalan government was facing in 1976 and try to find solutions to them while satisfying the objectives set by the NRC. For each of the main problems, a strategy and mechanism was created. These strategies or mechanisms were as follows:

(a) Inflation was hitting the Guatemalan economy through the escalating costs for increasing amounts of imported fuels and other goods and services. The lack of building materials - especially cement, iron rods, timber, glass and plastics, and the pressing need for them in reconstruction, could magnify the inflationary process. Therefore, the NRC set a quota system to manage basic construction materials and stimulated the private sector, BANDESA, BANVI, and other institutions to recycle wood in their construction process. The NRC also stimulated local cement related industries, such as block factories and other building material industries, to produce at their maximum capacities. In some instances, however, the quality of their product was lowered, due to the lack of standard control systems.

(b) The bureaucratic problem presented by Guatemalan governmental institutions and the delapidation of their resources due to overlapping functions and geographical areas was one of the main problems to be overcome. The scientific and technical staff of the Guatemalan government was competent, underpaid and underrated in status, while the administrative-political staff was overpaid and given the status of decision makers. The NRC tried to overcome this problem but failed outside its own interior structure. As a consequence, the reconstruction process was affected by inefficient, slow paced expensive bureaucratic practices that were often used to rehabilitate social services and other large infrastructural facilities. The scientific and technical staff wanted to move rapidly but this bureaucracy, managed by politicians, slowed down most of their activities and lost the good will of this technical staff.

(c) Migration from rural areas to urban capitals and finally to the metropolitan area of Guatemala City was another problem. Approximately 80 percent of the services and 65 percent of the industries are in this area and provide opportunities for jobs. The migration rate six months after the earthquake was estimated to be up to 150,000 persons (Chavarria 1978) a year. Some complementary problems were derived from this migration. One was the mushrooming of small "settlements" in public and private areas or the creation of

"palomares" or slum houses. Another was the rumor that the Guatemalan government was going to develop huge "free" urban projects. This rumor encouraged the desire to migrate because many people from the rural areas believed the rumor and decided to obtain a "free house." The NRC could not cope immediately with this problem because some NGOs had given free housing aid to some communities, thus adding substance to the rumor. To counteract this movement, the committee decided to subsidize rural housing projects to forestall future migration to urban areas. As a result the NRC sent some foreign and Guatemalan NGOs to the villages and towns of Chimaltenango, El Progreso, the rural area surrounding Guatemala City, the western part of Zacapa and Jalapa and to other rural areas affected by the earthquake. This was done in a deliberate attempt to retain future migrants in these areas and to stimulate development projects that would create better local conditions and induce the people to stay where they were.

(d) A shortage of money for community development in the Guatemalan government and in NGOs was seen as a fundamental problem. Most of the national budget was used to pay office workers, or to finance gigantic hydroelectric projects or other huge infrastructure programs such as the construction of roads, public buildings, airports, and so forth, and there was little money left over for education, training and the development of rural communities. The few such programs that existed were

operated paternalistically and were believed by members of the committee to be culturally meaningless. The NRC urgently needed funds for its programs and the money could not be transferred from existing development projects because the Guatemalan government considered it important to carry them out and because they were required by conditions set in international loans and guarantees. The NRC pressed the Guatemalan government to issue bonds and to transfer whatever money was available from non-mandatory programs. The Guatemalan Congress, through its Decree 8-76, legalized the issuance of up to 122.0 million U. S. dollars in bonds to finance the reconstruction process. Later Congress enlarged the 1976 budget by 190.2 million U. S. dollars also earmarked for reconstruction and development programs (Balcarcel et al 1978). On paper approximately 312.0 million U. S. dollars was authorized for the rehabilitation of the infrastructure and other development programs related to the reconstruction.

Other funds came from international sources of assistance. In addition, government to government loans and other technical assistance was made available. The amount contracted by these loans was close to 157 million U. S. dollars. This included some loans that were renegotiated during the emergency (39.9 million U. S. dollars) but excluded the cash donations given to the NEC by private individuals, NGOs and friendly governments that amounted to approximately 10.7 millions (Balcarcel et al 1978).

These funds were allocated by the NRC to the various Ministries of State of the Guatemalan government. Unfortunately

they were only partially used because of the inadequate capacity of the 174 governmental institutions to execute the programs that the NRC requested in 1976. Bureaucracy and the slow-paced operational mechanisms associated with it could not cope with these vast amounts of money. Programs were delayed year after year and funds were extended into the following year's budget until much of it was finally dissipated. The NRC tried to decentralize reconstruction activities by allocating some of the funding to the private sector, especially to NGOs, but governmental institutions fought against these decisions, using national pride as an issue. The result was a setback in the decentralization of reconstruction activities and a slow down in the reconstruction-development process.

It is worth mentioning that the best operational system used by the NRC was "FEER, Fondo Extraordinario Específico de Reconstrucción," which was managed by the Bank of Guatemala and had a funding of approximately 143.5 million U. S. dollars in 1980. This fund was part of the total amount of reconstruction-development money assigned to the reconstruction process. About half of it had been allocated to BANVI and the cooperative system for urbanization and development of housing projects.

A large amount of money allocated to the Ministries of Health and Social Assistance, Communications and Public Works, Education and Culture, and Interior was not used in 1976 and was reprogrammed in 1977, but of this, only 103.0 million U. S. dollars was

allocated for reconstruction programs. In 1978 this amount was reduced to 70.6 million U. S. dollars in spite of the fact that statistically reconstruction programs had 50 percent better efficiency than ordinary government projects. This meant that the Guatemalan government was cutting down on the social effectiveness of the NRC by diminishing its actual funding and in the long run, depriving communities of participation in the decision making process. The NRC continued trying to become an effective executive unit, able to manage its own funds and programs, but it did not have a good chance to succeed, given its bureaucratic environment.

(e) The NEC did not have the legal capacity to perform reconstruction programs and therefore could not coordinate the programs of NGOs. It therefore transferred the reconstruction activities it had started to the NRC. Fortunately, some NGOs saw the NRC as the solution to their own problems and a strong interaction between them was initiated by a trial and error process. This process was painful but successful. Mistakes were hardly ever repeated and the most serious problems were solved by dialogue and good will. As time passed, intense comprehensive interaction developed between NGOs and the NRC. The committee began promotion of development projects and NGOs reacted by pouring funds into the reconstruction process.

The total amount of direct assistance from NGOs is estimated at between 130 and 150 million U. S. dollars between 1976 and 1981. The exact figure is not known because NGOs usually did

not report their total investments to governmental offices. An additional amount of about 20 percent should be added to these investments due to administrative costs. Without any doubt, this massive flow of money represented the best and most positive investment in the improvement of the quality of life for poor communities ever made. It achieved far more than the much larger investments that went into government programs which never quite came off.

(f) Another problem arose from speculation about the real destination of reconstruction development funds. There was a lot of confusion between funds managed by the NEC and by the NRC. Groups with vested interests and political parties initiated rumors and defamatory campaigns claiming mismanagement of funds. The NRC, however, did not directly manage any funds but allocated them to other governmental institutions through the Ministry of Public Finance and the governmental banking system. The only funds that the NRC was permitted to manage were the emergency building materials funds, about 100,000 U. S. dollars in 1976. This activity was carried out by the Military Secretariat.

Rumors of misuse of funds created a lot of problems in some of the poor communities where people really believed them and lost faith in the NRC. Through much dialogue and open-door discussion, little by little, the confidence of the communities in the NRC was built back to the level needed for effective reconstruction.

(g) The lack of adequate urban land for housing projects in the metropolitan area of Guatemala City as well as the lack of an adequate infrastructure for public services presented another problem to the NRC. The NRC found about 35,000 families, only 20,000 of whom were due to the earthquake, living in "settlements" and other refugee camps. They were landless, homeless and extremely poor. Most of them had no way to make a living. This problem demanded a solution.

The Guatemalan government did not have an urban land acquisition policy. BANVI owned some tracts of land but only enough to meet about 10 percent of the needs. This problem of squatters settlements was a severe one and the NRC initiated negotiations with the land owners concerning land that was available and could be acquired. In some instances, due to bureaucratic problems and legalities, two years were spent in acquiring tracts of land that were, meanwhile, booming in prices due to inflation and speculation. Only the tracts of land acquired in 1976 and 1977 were bought rapidly and at prices not inflated by economic problems. The NRC, through BANVI and the Land Commission, finally bought some pieces of land at high prices but the ones acquired were not large enough to meet half of the needs.

(h) Competition for building materials, but especially for labor, between the private sector and the NRC presented another problem. The private sector, above all large construction companies, demanded building materials and qualified labor for

their own reconstruction projects. The NRC had funded a series of large building projects for such facilities as small hospitals and health centers, large schools, bridges, highways and administrative buildings, through several other government institutions - mainly the Ministries of Communications and Public Works, and Public Health and Social Assistance. Some of these were being built by the private sector. The industrial capacity of Guatemala to produce building materials was overtaxed and shortages became a bottleneck for the development of reconstruction programs. Without any doubt, a greater bottleneck was presented by the scarcity of qualified labor. Private and governmental programs, initiated by the NRC, were initiated to train workers as electricians, masons, carpenters, blacksmiths, plumbers, and so forth. Most existing skilled labor was hired by the private sector and an unskilled or poorly trained work force remained to work for government institutions or in NRC reconstruction programs. A migration of skilled labor from rural to urban areas was triggered, depriving rural areas of part of their social organization and their best technical staff. As a result, communities could not obtain the technical leadership needed to rehabilitate their infrastructure. The NRC, with the help of INTECAP (Technical Training Institute) started programs of in-service training, self-construction and mutual aid. These programs were very successful because they permitted

the training of unskilled labor in productive activities as well as providing the basis for organizing communities for future development activities at the grass roots level.

(i) The NRC, from the beginning, lacked technical field personnel and this became its main weakness since it had difficulty supervising work done by other government agencies. The necessary technical staff was supposed to be lent by the other government agencies but in spite of periodic requests, this personnel was never assigned to the NRC. Field supervision was carried out using very few persons and this few could not cover all geographic regions or perform all of the functions assigned to them.

The Guatemalan government did not have the structure or operational and functional capabilities to reconstruct the infrastructure lost in the earthquake and the NRC had recognized this from the beginning. It promoted the organization of communities and their participation in the reconstruction process through local reconstruction committees or through any other existing community group. This established the mechanisms and communications system necessary to improve the administrative, managerial and operational potential of local communities.

(j) The NRC was legally authorized to issue decrees, mainly to transfer funds to executive units, to buy land, recoup loans, to financially support cooperative systems and to legalize any other activities needed to facilitate the reconstruction process. The mechanism of decrees sped up some

programs but by 1981 even this process of issuing decrees had become bureaucratized and it was difficult to simplify it.

(k) In order to limit the overlapping of programs in rural and urban areas, the NRC promoted the creation of "Departmental Institutional Coordinating Units" led by the governors of each department. These Coordinating Units were supposed to integrate all the activities of regular governmental programs and reconstruction programs and projects in order to optimize the use of funds, equipment and personnel. Some such units succeeded and some failed, depending upon the interest of each governor. The concept was regarded as a good one and it permitted the NRC to correct some of its policies, strategies and actions during the first two years.

(l) Another problem arose because middle class families affected by the earthquake did not have access to subsidized loans. To solve this problem, the NRC stimulated the banking system into giving loans to this sector at normal rates. Close to 13,642 loans were approved, amounting to some 63.4 million U. S. dollars (Balcarcel et al 1978).

Summary of NRC Problems and Solutions

As can be seen, the NRC developed many strategies and mechanisms to speed the reconstruction process. Some of the strategies and mechanisms were carefully planned on the basis of knowledge and understanding of the

problem, but other strategies and mechanisms were improvised due to emerging and not well understood conditions. The NRC formed strategies and mechanisms for solving short and medium term problems and, on the basis of them, created programs and projects. The form of these programs and projects related to the Committee's philosophy of community organization and participation; perpetual use of natural resources, improving the quality of life, and the rejection of consumerism and paternalism. However, the NRC also had to cope with daily problems and set strategies and mechanisms through "instantaneous planning," based on the knowledge and experience of its scientific staff.

During 1976, 1977 and 1978, the NRC was the highest authority for the reconstruction process, but after 1978 it was transformed slowly into a coordinating unit rather than a policy-decision making entity. This loss of power and influence occurred due to a lack of governmental and political support, some of which was due to a lack of understanding of its functions and some to losing its original credibility and charisma. By 1981, the National and International Cooperation Unit was the only one that still maintained credibility and achieved a degree of success in its activities.

Due to the growth of political violence between the right and left, some of the NGOs reacted by freezing their activities, leaving the violent areas, or transferring their projects to the eastern highlands of Guatemala, where continuous but destructive small earthquakes derived from volcanic activities frequently produce infrastructure damages in very economically poor communities. Many NGOs left the country because the international demand for aid and cooperation was increasing worldwide and there were far less dangerous places to work than Guatemala in 1980 and 1981.

Today, in 1981, other units of the NRC are still functioning at a coordination and advisory level, some executing small projects, but it

appears that the NRC will be submerged by the consequences of a manmade disaster produced by political violence. Such violence is the worst enemy of development and the greatest cause of social and economic deterioration. From the beginning of the reconstruction process the NRC took the view that violence had to be prevented by development activities. Time has proven the NRC vision correct. The answer of the NRC to political violence, guerrilla activities, repression and any other activity increasing social tension was to carry out a continuous peaceful development process, based on an intercultural sharing process and the perpetual use of the natural resources that could insure the presence of man in the landscape.

Relationship of the NRC to Foreign Agencies and Groups

As already stated, the NRC inherited some NGO projects from the NEC as well as the obligations of the Guatemalan government toward them. The NEC had assigned some towns and geographical areas to different NGOs and when the NRC came into being they were working almost on their own. The NRC wanted the activities of NGOs coordinated by a special unit that would facilitate administrative procedures, bureaucratic paperwork and furnish consistent guidelines for the reconstruction process. The Committee was especially concerned because it felt some NGOs were promoting paternalism.

The NICU of the NRC was created in the last week of March, 1976, but its members did not have solid experience and knowledge concerning the functions, scope, goals and structure of the NGOs. From the beginning, however, several operational concepts concerning NGOs were followed. The most important concept was that the NGOs should have autonomy in the management of their own funds. The NRC knew about some of the negative experiences NGOs had during the "reconstruction" of Managua, Nicaragua in 1972 and during the rehabilitation of the coast of Honduras after Hurricane Fifi.

The NRC was not interested in managing money but in obtaining a serious commitment from the NGOs to carry through development programs and rehabilitate the infrastructure. It preferred to discuss the type and purpose of aid, final results and the quality of programs as well as their social and economic impact with the NGO and leave the management of money to the NGO who would bear the cost of the commitment. If it accepted money, then it also would have to establish and manage programs or allocate the money to some organization with such a program. Besides, if the NRC received money to carry out x number of projects, galloping inflation could diminish the size of the projects before they were ever accomplished. Most of the NGOs had a better and more economical administrative system than the Guatemalan government and it would be irrational to obtain money from relatively efficient NGOs and transfer it to relatively inefficient Guatemalan government agencies where administrative costs were high. It was decided therefore that NGOs should have autonomy to manage their own money because that meant also that they would manage their own programs.

The NGOs needed to have freedom of action and movement. In 1976, most of the administrative and technical staff of the NGOs were better qualified than most of the NRC, with the exception of the NRC scientific staff. In addition, NGOs had international experience and the NRC could benefit and learn from it. The only rational way for the NRC to support NGOs was at the conceptual level. The Committee followed the policy that the NGOs could have the freedom of action and movement to contact communities and, with the local people, jointly decide what to do, but always framed by the general guidelines of the NRC.

During the first months of 1978 the idea of freedom of action and movement was expanded into a mutual feeling of trust. If the NGOs were

going to trust the NRC, this entity should trust them by recognizing their value judgements, their humanitarian approach, their interest in integrated development and in a word, their conceptual sanity. The NRC could not manage the NGOs if there was distrust and misunderstanding. It was granted by both sides that mistakes were going to be made, but sometimes mistakes bring about humility, and a willingness to learn.

The NRC wanted the NGOs to be effective, that is, to achieve their goals and at the same time, try to be efficient. This combination means that mistakes will be made but things will be accomplished. Some mistakes were made mainly in the reconstruction of infrastructure, but very few in the community development process. Unfortunately, in late 1980, a struggle for "perfectionism" was initiated in the NICU and the consequence has been more government control and paperwork in NGO programs.

The third principal followed by the NRC was to legalize the operations of the NGOs in the reconstruction process through signing contractual agreements. Most of the NGOs involved in the reconstruction process were working in Guatemala for the first time and they did not have the proper legal status to legitimize their work in the country. Some had operated for several months or even years without obtaining the proper authorization to legalize their status. In 1976, lawyers at the NRC prepared the proper documents in the form of legal agreements between the NRC and the NGOs. These agreements were signed by the legal representative of the NGOs, the Executive Director of the NRC and by representatives of communities where appropriate.

These agreements permitted the NGOs to legally operate in Guatemala. To the NRC, it meant that the NGOs were committed to a community development-reconstruction process and that as a result, infrastructure was going to

be built or improved. Unfortunately, as things turned out, some NGOs were more interested in building infrastructure than in starting a development process. Fortunately, from the point of view of the Committee, they left after the infrastructure was rebuilt.

Policy Decision With Respect to Foreign Groups

About 210 NGOs were engaged in the emergency and relief operations and, according to the NEC, most of them did an excellent job. The ones that operated only on a short term basis during the impact, relief and emergency phases, did not want to participate in the reconstruction process and about 25 percent of those 210 NGOs left Guatemala by the end of April. In 1976, about 70 agencies interested in long term rehabilitation and development decided to participate in reconstruction-development programs.

The NRC needed as much help as it could get due to the magnitude of the disaster and invited NGOs to participate in the reconstruction process through development-oriented programs. The NGOs and their staff were welcomed as "working ambassadors" by the NRC and they were encouraged to select development programs on the basis of their own experience and potential. Several geographical alternatives were given to them with the objective of concentrating their efforts in an area from which their influence could spread to other reconstruction programs and projects in peripheral towns. This set the grounds for the most important policy decisions. They were intended to transmit the idea of reconstruction-development to NGOs. This process of involving NGOs involved the following steps or measures:

- (1) An invitation was issued to the NGOs to participate in the reconstruction process through conducting development-oriented programs in areas jointly selected by the NGO and NRC.

(2) Total autonomy was given to the NGO in the management of funds and freedom of action and movement in its operational and administrative activities were granted.

(3) Activities of the NGOs were legalized through an agreement that was based on legal and ethical issues as well as upon explicitly stated plans that committed NGO to rehabilitation and development.

(4) The directors and other staff of the NGOs were welcomed as working ambassadors, with a similar rank as the diplomatic corps, but with no protocol.

(5) The NRC established and reinforced guidelines for the reconstruction process but communities with the assistance of the NGOs and local reconstruction committees set local goals and objectives.

(6) The NRC committed itself to facilitate all the bureaucratic paperwork needed to speed up development of the reconstruction programs of the NGOs.

(7) The NICU acted as the coordinating branch of the NRC and its duties were to promote community development projects among the NGOs, to exchange information with them, and to optimize the effectiveness of development programs by establishing regulations and guidelines to avoid unnecessary and severe cultural disruption.

These policies established the structure that initially defined the relationship between the NRC and the NGOs. After these policies were set, however, a series of pseudo-NGOs tried to take advantage of the opportunity that the NRC had given to private voluntary agencies to operate in Guatemala. Therefore the NRC had to tighten its policies by introducing mechanisms to control the work of some agencies. These mechanisms consisted

of insisting upon definite time tables and schedules to carry out the projects and related activities. Most of these bogus NGOs left the country by their own choice, with the exception of two that had to be invited to leave the country. One of the main problems with such organizations, which were often newly formed, was that they promised projects for which they had no funds and wanted the NRC to legitimize their money-raising efforts outside Guatemala. The NRC was interested in the organization and the participation of communities in development programs and could not support entities that did not want to sign an ethical-legal agreement to operate in Guatemala or have the technical and administrative know-how to raise funds for development projects. In spite of these precautions, the MEC, and later the NRC, were informed that some groups that did not do anything in the reconstruction process but nevertheless had raised funds that never came to Guatemala. Others tried without success to import duty free goods, services and materials into the country to be sold later at a profit.

The agreements signed during 1976 and 1977 contained many undefined obligations and unspecified activities as well as generalities that later created confusion and interpretation problems. After 1978, agreements became more specific, detailed, and more development oriented and since that date they have improved constantly.

The NRC signed about 165 agreements and addenda with some 110 NGOs, 85 of which were with international or foreign organizations. These agreements account for about 45 percent of the total community development-reconstruction programs carried out by the NRC in the area affected by the 1976 earthquake.

The Guatemalan government expected NGOs to fulfill their commitments based upon the agreements and addenda. At the beginning, 1976 and 1977,

the NRC was extremely interested in the creation of a social infrastructure as a means of giving communities the mechanism to reconstruct their own infrastructure and services in order to improve their own welfare, but after 1980, due to the increase of political violence, it advised NGOs to build more physical infrastructure than social organization. The most effective period of reconstruction-development for NGOs was the initial period from March 1976 to November 1977, and especially from February 1978 to November 1980, because during these periods the NRC guided the reconstruction process toward community development and the most successful projects were carried out. The NRC saw to it that the social infrastructure built by the reconstruction-development programs of the NGOs was carried out with community participation and organization. Through NGOs and the NRC, communities rediscovered or introduced development concepts and improved administration of resources. They also developed the capacity to manage cooperatives and increased self-reliance and self-expression.

NGOs worked using these basic concepts until 1978, when the NRC introduced complementary concepts as guidelines to further promote community development programs. By that time NGOs had developed a joint decision making process with the NRC. This process was used to solve emergency problems, improve mechanisms and procedures used in development programs and to insure commitment to the well-being of the communities.

After 18 months of field experience, some of the policies and expectations of the NRC had to be revised due to mistakes that were recognized by NGOs and NRC. This willingness to revise strategies was a healthy indicator that needed change was occurring. The new concepts introduced were a mirror of NRC commitments to the communities from which they sprung.

It was felt that NGOs needed to introduce these new ideas into their projects so that they would be more effective at the community level.

The new ideas introduced as policy were:

(1) The NGOs had to succeed in their projects in order to promote confidence between the communities and the NGOs. Unfinished projects did not mean just lack of funds but also failures in community development. This lowered local confidence in the development process itself.

(2) Development should be regarded as a means and an end. Development should not be used to obtain prestige for an agency or to create dependence in communities upon foreign values or institutions. Development does not have to transfer technologies, culture or institutional concepts that create social unrest, stagnation and dependence and it has to be a humanitarian goal as well as an intercultural process. In the long run, it amounts to an attitude toward nature and society.

(3) The most important goal for the NRC is the well-being of people and no mechanism, NGO, foreign value or organization has a higher priority than the well-being of people. NGOs need to commit themselves to the local people and relate their programs to the local environmental conditions and participate as members of the community and not as outsiders that come to "help." NGOs should share their attitudes, money and purpose with people. If their activities are not accepted by local communities, development is not being achieved and the NGOs need help to initiate an intercultural process that will permit the acceptance of the NGOs. This may mean changing the NGO instead of changing the people.

(4) NGO programs should not originate from mandates of their donors, boards of directors, or foreign policies of their countries, but they should originate from the social, economic, biological and spiritual needs of the communities they serve. NGOs are not in the reconstruction process to offer charity, but to cooperate with people in their own efforts to achieve their own expectations and to win their struggle for freedom of movement and independence.

(5) The reconstruction process should encourage self-expression, self-reliance and biological independence. The NGOs should not attempt to control the destinies of communities by making them dependent on funding, technology and emotional ties to the agency.

(6) NGOs have to participate in the reconstruction process by identifying local leaders that will become the axis of communication and diffusion of development consciousness. The NGOs should not try to solve the problems of the communities by themselves, but should stimulate the leaders of the community to build their own strength and capacities to solve them.

(7) The best development project is the one that can be carried out by the community with a minimum of outside input. The more inside output and the less dependence on technological and conceptual transfers, the more environmental resistance to hazards and risks will improve.

(8) Development also means the organization of time and space as well as the production of orderly landscapes. The organization of time and space means that the community will use different levels of energy for its development than in the past in order to optimize its way of life. Nature should work for the communities by transforming higher levels of energy in goods and services to people by local

appropriate technologies. Some examples of appropriate technology are tajareque construction, irrigation ditches, contouring, food caloric symbiosis, terraces, management of organic matter and others that are the byproduct of the intercultural sharing process and not antigoods and antiservices such as pollution, erosion, deforestation, mass movements and others. If these negative factors are produced, the NGOs are creating deterioration and not development.

These were the main new guidelines given to NGOs in the 1978 and the NRC expected them to be observed at the local community level. The NRC expected mistakes derived from the interpretation of these concepts, but NRC realized that mistakes don't mean failures, but the need for a new strategy to correct and achieve an objective.

Policy With Respect to Conditions Under Which Aid Would
be Offered to Guatemalans

The NRC wanted foreign aid to go directly to the communities through NGOs. Experience with bilateral government to government aid programs, such as AID, CIDA, World Bank and others, had proved unsatisfactory when the funds were managed by Guatemalan executive units.

In addition, foreign bureaucracies, with large and expensive overhead, required extensive paperwork intended to assure a degree of program rationality, honesty and achievement. This paperwork and the standardization it fostered retarded negotiations to obtain donations or loans for affected communities. When all the bureaucratic requirements were met, funds from foreign governments or international organizations were deposited with and managed by the Guatemalan government bureaucracy. This meant an additional slow-down in reconstruction projects, high administrative costs and very little real investment in actual projects. It became evident that programs that were fully controlled by the government and

that did not allow communities to develop their own capacities and managerial skills, and did not develop local capacity to look for funding in the future, did not achieve development.

Some government to government bilateral programs were judged by the NRC to be ineffective, bureaucratized and paternalistic with high social and economic cost. Other programs based on loans from a few international banks were believed to be still more inefficient and over regulated. Nevertheless, valuable technical and economic assistance were provided by the International Development Bank and by the U. S. Agency for International Development.

The NRC could not wait for months to negotiate donations and loans from other governments or international agencies and had to rely on Guatemalan government funds or on private funds from Guatemalan or foreign sources, or on funds made immediately available by friendly countries such as the U.S.A., Venezuela and West Germany. The Guatemalan government by law had appointed different Guatemalan institutions to negotiate donations, loans and other funds. Regarding foreign aid, the GSNCEP managed bilateral government to government agreements and international loans and the NRC managed agreements between the Guatemalan government and NGOs.

The NRC established a policy in 1976 that an agreement was an aid commitment to develop or rehabilitate a community stricken by the earthquake. It tried to oppose the dependency concept of "free aid" to communities and made efforts to make sure that communities would pay something for the construction of infrastructure and services by NGOs. These funds were to be recycled as "seed funds" for future development within the proper communities. The NRC failed in their efforts to require this procedure, however, because certain rumors started by politicians advised communities not to pay for the infrastructure being built because it was free aid

accepted by the Guatemalan government and therefore the communities had the right not to pay for it. This failure of communities to conform to NRC policy created such a serious problem that some funds were never recovered, as in the cases of Comalapa, Cubulco, Sumpango and San Lucas Sacatepequez.

In addition to community resistance, this guideline requiring community contributions was not followed by many NGOs because some of them represented foreign governments and churches whose policies and attitudes toward development were shaped to satisfy foreign donors or political interests that willingly or unwillingly promoted paternalism through basing programs on charity rather than self-help. Under the circumstances of the earthquake, the NRC accepted almost all sorts of aid, including free aid which in principle it opposed as paternalistic. The policy was to obtain as much aid as possible before the "international momentum" of the earthquake was lost and attention shifted to other disasters in the world.

The NRC believed, however, that free aid means dependency on three levels. First, it creates dependency at the government level because the acceptance of goods and services represents a political commitment to the donors. Second, it removes the stimulus to produce local goods and services and therefore disrupts competition. Third, free aid is likely to produce negative cultural impacts derived from the distribution of foreign goods and services because people get used to substituting these goods for domestic products. Free aid also creates a process of deterioration in quality because people don't compete in the market to provide quality, but accept what they get free.

As a result of these potential problems, the NRC wanted free food to become "food for work," clothing to be sold at token or subsidized prices, and houses and other services to be paid for at subsidized prices so that

revolving funds to be used in the community development could be created. It believed that all free aid should have a counterpart in labor, money or matching funds. The Committee regarded free aid as positive cooperation during an emergency or relief operation, but after that, when reconstruction began, free aid meant unnecessary social and economic paternalism and made the groups receiving it weak and fragile. As a consequence of this strongly held belief, the NRC attempted to discourage free aid programs by institutions such as CARE, the Guatemalan Red Cross, ACOGUA, The Boy Scouts, CARITAS and CIDA. Nevertheless, many churches and friendly governments gave away tremendous amounts of free aid in food, clothing, houses and other services that, in the view of the committee, could have become "seed funds" for future development.

The NRC accepted free aid programs because some of them were inherited from the NEC which had approved free aid for rehabilitation programs. In other cases it accepted such programs because it did not have the political strength to oppose them. Such programs represented the humanitarian goals and foreign policies of friendly countries, and even though opposed to them, the NRC did not have the stamina or the power to stop or discontinue them.

The NRC also promoted the use of some free aid as an inducement to community organization and participation. As a result, child care, home economics, health and sanitation and educational programs were strengthened and achieved different degrees of success, especially in the urban areas and towns, but above all, in the Departments of El Progreso and Zacapa, where they were highly organized and well managed by the Social Promotion Unit of the NRC.

The main problems created by free aid, according to the NRC, derived from some NGOs with child sponsorship programs. These programs attempted

to help children by giving their families free aid in the form of food, clothing, other free goods and even money. The Committee felt that such programs made the children and their families dependent on outside sources for help, especially in the case of programs conducted during 1976 and 1977 by AMG International and Asociación Misionera Guatemala.

It is worth noting that some NGOs evolved programs that, instead of providing individual goods to a child or his/her family, started providing community services. This meant that they were initiating community development activities as an alternative to paternalistic practices followed in the past. Among these NGOs the Foster Parents Plan is worth mentioning as an organization that concentrated its activities on more positive community development projects and gave loans to cooperatives and other organized groups that have higher development goals and expectations.

Communities were encouraged to see aid and cooperation as reciprocal efforts to achieve community development. Aid through the socioeconomic mechanism of cost sharing was intended to provide a "seed fund" within the community or a "returned loan" for the development of other communities. This multiplying effort was used by AID-NRC in their lamina projects.

AID sold roofing to individuals in a community at a subsidized price. The money collected by this program was put into a community "seed fund" to be invested in community development projects. In this way an organizational structure was initiated to assist development programs. The end result of the AID program was that additional infrastructure was created as a byproduct of lamina distribution. Even though roofing materials were distributed, its main goal was community organization and participation.

Most projects developed by NGOs were subsidized and some seed funds were created. The NRC, through the National and International Coordination Unit (NICU), tried to minimize subsidies and to increase local contributions

but a few NGOs refused on the premises that the donors, private and governmental, wanted to donate aid free. In some cases, agreements were reached to satisfy all the parties, and the goods, services and infrastructure were sold at token prices. Even so, in most cases, communities wanted free aid. The Guatemalan government had historically given free aid to communities in the form of schools, potable water systems and other goods and services without requiring local contributions. As a consequence, it was very difficult for the NRC to change that paternalistic approach.

Without any doubt, the NRC, from 1976 to 1981, promoted an anti-paternalistic approach and stimulated the use of subsidies rather than free aid. Through subsidy programs, free aid was transformed into labor and seed funds, as a by-product of the process of distributing aid. Nevertheless, it was forced to accept programs where free aid was at the core for the reason expressed above.

Policy with Respect to the Assignment of Specific Responsibilities to

Specific Outside Groups

The Non-governmental Organizations (NGOs) involved in the 1976 earthquake disaster were divided into three specific groups. One group specialized in impact, emergency and relief programs; another only in rehabilitation and development, and the last in both programs mentioned above. At the time of the earthquake, some NGOs such as OXFAM, World Neighbors, the Mennonites, Christian Children's Fund, Red Cross, the Maryknoll Congregation, and about fifty other NGOs were already working in Guatemala. When the earthquake occurred these organizations asked their headquarters for help and immediately started relief programs in the areas where they were working. OXFAM-World Neighbors attended to some of the most damaged parts of their working

area in Chimaltenango; the Mennonite Central Committee also helped in the Chimaltenango area. CARITAS, Christian Children's Fund, World Vision and CARE programs were nationwide but began concentrating their efforts in the communities affected by the quake. The Primitive Methodists did the same in Totonicapán and the Rural Reconstruction Movement reinforced its programs in Jalapa while parish churches covered their communities.

The NGOs and other institutions that were already in Guatemala therefore stayed in their working areas and spread their programs out from those areas. The NEC first, and the NRC later, tried to cover critically damaged areas with other Guatemalan and foreign government institutions and to assign newly arrived NGOs who wanted to cooperate to appropriate locations. The French NGO-Operation Hope went to the area of Xiquín Sinaí in Chimaltenango; Save the Children Alliance to nine municipios (counties) of El Quiché; the Boy Scouts to Bella Vista; the Rotary Club to San Pedro Sacatepéquez; Fratelli d'Italia went to Comalapa; the Aragonese Committee to Zaragoza; the Jewish community to Sanarate; Norwegian Red Cross to Patzún; the Norwegian Church Aid to San Martín Jilotepecque; AMG-International to La Verbena, Guatemala City; Food for the Hungry to Villa Nueva; the German and Austrian Red Crosses to San Juan Sacatepequez. Others, like Plenty, went to Guatemala City, San Andrés Itzapa and later to Sololá; The Seventh Day Adventists to Sta. Lucia Milpas Altas; the Episcopal Church to Zacapa; The Salvation Army to Tecpán Guatemala, and so forth.

The main reason for this distribution of NGOs was the need for immediate cooperation. Many areas were unattended and the NEC and especially NRC decided to fill the unattended critical areas on a sort of "I want help, you go to this unattended area" basis.

The Guatemalan government, with the support of other friendly governments, attended mainly to the metropolitan area of Guatemala City, the departmental capitols and some of the large municipal towns in order to establish a strategic network of relief and emergency centers and services. It was decided that NGOs and other groups would complement this governmental network by attending to other large municipal towns, most of the large villages and a few of the small villages and hamlets in order to concentrate NGO services.

There was an exception related to "squatter's settlements" in Guatemala City. These "settlements" were supported by church organizations before the earthquake and during the first hours after the earthquake these organizations contacted other larger church nuclei, like the Norwegian AID Church, the World Church Service and the World Council of Churches and concentrated their efforts on some of the "settlements" in the metropolitan area of Guatemala City.

This sort of agency assignment was not a casual decision. The NEC, but especially the NRC, wanted to decentralize rehabilitation and reconstruction activities and the NGOs were the institutions that showed the greatest willingness to go to unattended areas. Immediately, however, problems started to arise. Some of the NGOs already established in Guatemala considered their working areas as their own and they sued for increased spatial hinterlands as well as increased functions. The NEC and the NRC became judges to decide this unfortunate litigation. Some NGOs did not have the capacity to react or cope with all the problems in their areas and needed support from other NGOs, but sometimes they refused that cooperation in order to maintain their territory "untouched."

Another problem was the overlapping of functions between NGOs and

government agencies. In some cases a NGO was assigned a geographical area as well as specific functions, but later some Guatemalan government institution would arrive and claim jurisdiction over the area. In addition, many Guatemalan humanitarian committees were formed after the earthquake and were working on their own. They had resources, motivation, and a lot of private sector support. They went to the areas with easy accessibility to "help," but most of the time their services overlapped with those offered by Guatemalan governmental institutions, other friendly governments and NGOs. By the end of September 1976 most of the damaged areas were covered with very little geographical and functional overlapping. Instead of litigation, the NGOs were now coordinating their field efforts among themselves, because the NRC did not have the manpower to provide field support.

The problem of manpower was a serious one for the NRC with respect to personnel for coordination activities with NGOs. The NICU had one coordinator and two typists from 1976 to June 1978. Its Social Promotion Unit was supposed to supervise the performance of NGOs and evaluate their activities, but in addition to this it was supposed to organize at least 1200 communities so that they would participate in a reconstruction development process.

The only manpower available on a part-time basis was the social workers assigned to the Social Promotion Unit (SPU). They were trained in late 1976 and early 1977 in techniques for evaluating the quality of the infrastructure being built, the social and economic impact of reconstruction and development programs and in the promotion of better standards of life. Unfortunately, in late 1977 and early 1978, due to political conflicts,

this unit did not perform the supervisory and evaluation activities it was supposed to perform and these evaluations had to be partially done in 1978 by the PRU, using engineering staff. The evaluation only analyzed the quality of infrastructure but not its social impact.

During 1978-1979, the NICU tried to evaluate the performance of the NGOs. It asked UNICEF to sign a contract with an economist for this work but the evaluation was not completely developed due to lack of institutional support from UNICEF and from the NRC.

Other evaluations of NGO achievements have been made. One was conducted for United Nations by two architects who were lent to the NRC. They evaluated the physical infrastructure built by NGOs quantitatively and qualitatively and made a reconnaissance of the social and economic impact of NGO programs. The evaluation of social and economic impact, however, was a sub-product of the evaluation of the physical infrastructure and therefore was very general.

Still other evaluations of the role of NGOs in the reconstruction process were conducted by other organizations, such as OAS, AID and the University of Stockholm. This latter study analyzed the economic efficiency of the programs carried out by Guatemalan governmental institutions and compared them with the efficiency reached by NGOs. It clearly showed that at least a 2.5 to 1 ratio in favor of the NGOs existed in economic efficiency.

The NICU of the NRC also conducted its own evaluations during 1976, 1977, 1978 and early 1979. Coordinators received reports from some NGOs and went to check them in the field. It was a well known fact that

NGOs reported less construction of infrastructure and other activities than they actually carried out, but the percentage difference was very small. Most of the time their performance was substantially better than governmental performance and their achievements in the development process were also greater in spite of the fact that they sometimes did not follow the guidelines of the NRC.

As in any process, there were mistakes, mainly in the building of physical infrastructure and these mistakes became mechanisms used to attack the NRC and the NGOs by governmental institutions such as BANVI, the GSNCEP and the Ministries of communications and Public Works, and Health and Public Assistance. For these institutions the issue was not how much good the NGOs and the NRC had done for the communities and the country, but how many mistakes they had made. Mistakes were exaggerated to discredit NGO operations.

The NRC had only a moderate capacity to evaluate and supervise NGO programs. It had to accept cautiously the evaluation of other impartial institutions that did specific evaluations. All of these showed that programs carried out by the NGOs were more socially effective, had more economic efficiency, had a better quality, and achieved more rehabilitation of the infrastructure than the ones done by the Guatemalan government. Unfortunately, these advantages also exposed weaknesses in Guatemalan government programs carried out by the Ministries of State. For example, it was shown that government programs were at least two times more expensive; they took more time, were paternalistic and did

not organize communities as development entities and therefore, the momentum created by the earthquake for development was lost. These negative comparisons between government and non-government programs provoked further, more serious attacks from the Guatemalan government bureaucracy on the NRC and led to an eventual lack of governmental and political support for its programs.

Guatemalan Governmental Programs Involved in Reconstruction

As has been stated, the Guatemalan government did not want to create a "Super Ministry of Reconstruction" to rehabilitate and develop the region damaged by the earthquake, but to use the existing institutional structure and reinforce it by means of the NRC, which would be a decision-maker and coordinating unit as well as the highest authority for all reconstruction activities.

The President of Guatemala is the President of the NRC. That means that the Ministries of State are under him and that the Executive Director of the NRC represents the President. As a result, the Director of the NRC has the power and dominion the President wishes to give or transfer to him. As an organization with defined lines of authority and responsibility, the NRC was well conceived. The NRC and its four authorities, the President of Guatemala, the Executive Director, the General Coordinator and the Representative of the Cooperative Systems, decided policies and formed strategies and mechanisms to be used in the reconstruction process. This top authority structure was supported by the scientific and technical staff of the NRC, acting as Unit Coordinators. Using this structure, the Committee attempted to coordinate all disaster-related activities, including the ones carried out by the

Ministries of State. These Ministries provided the operational units to perform building activities and the rehabilitation of infrastructure and services.

Through the General Coordinator, the Minister of Public Finances, the NRC obtained the advice of the GSNCEP in economic and financial matters, and through this association integrated reconstruction activities with those derived from the National Plans for Development 1975-1979, 1980-1984.

It is clear that the major weakness of the NRC was in not having its own operational units capable of actually carrying out reconstruction activities. On the other hand, if such had been the case it would have meant managing funds. Money brings power but also potential corruption. The NRC perhaps could have rehabilitated more infrastructure by managing its own staff and money but it also might have been tempted to become another "bureaucratic" institution serving no social meaning or purpose, and the impact on the development of communities might have been very small.

Guatemalan Governmental Involvement in Financing the Reconstruction Process

From the issuance of bonds, taxation and by rearrangement of the national budget, the Guatemalan government, in 1976, obtained an initial \$312.0 million dollars for the reconstruction process. In addition it obtained about \$157.0 million dollars in loans from international banks and friendly governments and about \$10.7 million dollars in donations to emergency and relief operations. From these sources the reconstruction process received a total of approximately \$480.0 million dollars to

initiate programs in 1976 and 1977. Of these, about \$143.5 million were put into actual operating Funds for Reconstruction, FEER.

In addition to this amount, the NGOs invested amounts estimated at between \$130.0 to \$150.0 million dollars and insurance companies paid benefits of about \$36.0 million dollars on insured losses. This means that the minimum total amount of money put into the reconstruction process was approximately \$676.0 million dollars. This represents the largest and most productive effort directed towards development and reconstruction activities ever invested in a five year period in the history of Guatemala. In five years, but especially from April 1976 to June 1979, more infrastructure was built than in any previous period of equal length. It also permitted an organized community development process on a large scale that could have future consequences for development if the results of this effort were not destroyed by the political violence which began to emerge in 1979 and 1980.

Instead of handling the funds itself, the NRC decided to finance the rehabilitation of infrastructure by allocating funds to institutions responsible for specific activities or by transferring obligations to operational units of the Guatemalan government that could carry them. Housing programs in the urban area were assigned to the National Housing Bank. This institution received about 50.0 million dollars of the 85.2 million it was originally supposed to get for housing projects. By late 1980 it had not completed the work expected on its projects due to bureaucratic inefficiency, the lack of urban lots and to institutional reorganization.

In rural areas, BANDESA was responsible for housing programs and had a budget of approximately 43.0 million dollars. According to the Committee, it carried out its programs in a very positive and successful manner. Other banks received 10.0 million dollars to provide housing loans at four percent interest. This and related programs, oriented toward the emerging middle class and to the poor, have been successful in the view of NRC.

The total cost of the housing projects developed by NGOs and other institutions has not been determined exactly, but the minimum investment is estimated at about 45.0 million U. S. dollars, including administrative costs. These programs built approximately 30,000 permanent houses and about 143,000 "temporary" ones. Another 5.0 million dollars was guaranteed to the banking system in order to cover up to 50 percent of the private loans the banking system made to individuals. The private banking system also provided close to 63.4 million dollars to upper middle class persons to reconstruct or rehabilitate their houses. The total amount that has been invested in housing projects may add up to 251.0 million dollars, or approximately 34 percent of the total investments made in the reconstruction process. It is estimated that there were well over 85,000 beneficiaries of these housing programs.

The rebuilding of community facilities was carried out mainly by three institutions. The Municipality of Guatemala City was in charge of the reconstruction and rehabilitation of all potable water, drainage and sewage systems, chlorination plants, streets, avenues and other services in the metropolitan area of Guatemala City. INFOM was in

charge of providing economic and technical support to rehabilitate municipal buildings, potable water, drainage and other services in departmental capitals, and large towns and villages. UNEPAR was responsible for small potable water systems in small villages and hamlets in rural areas.

Government buildings, communications services, highways, bridges, roads, telephone lines, etc. were rehabilitated primarily by the Ministry of Public Works and Communications with the help of the U. S. Army Corps of Engineers and the Mexican Highway Departments (in the case of a section of the Atlantic Highway and from Patzicia to Godinez). Some of this work was done by operational units of this Ministry but it also invited the private sector to bid on larger projects.

Educational and health facilities were sometimes built by this Ministry or by the executive units of the ministries responsible for health and educational activities. Unfortunately, in the Guatemalan government there was considerable duplication, overlapping and malfunctioning with respect to the construction of infrastructure because almost every ministry created its own operational unit to perform construction work.

Problems Faced by the NRC With Respect to NGOs

One of the most important problems faced by the NRC in dealing with NGOs and with the rest of the Guatemalan government arose because of the presidential election of 1978. Two of the four top executives and some technical staff members were selected by middle of the road political parties as candidates in the political campaign of 1978. Official support

from the political party in power was provided, however, to the former head of the National Emergency Committee. This meant that several of the major figures in the reconstruction and emergency relief process opposed each other in the presidential election.

The issue behind the political struggle in this campaign was a difference of opinion concerning the future of Guatemala. The NRC wanted to improve the quality of life of Guatemalans. To pursue this goal, the NRC had created a new concept of development for Guatemala based not only on economic growth but also on grass roots community development. During the pre-earthquake period, Guatemala had been improving in real economic terms and private sector business was flourishing. Social progress, however, was not taking place in the rural communities of the country. The NRC attempted to create a democratic climate that would allow all social classes, and especially those with low incomes, to participate in economic development. NRC policies were supportive with respect to the private sector and large business enterprises but these policies also generated a vast grass roots social development program in order to encourage and to spread growth in economic benefits to the poor.

By doing this the NRC felt it was presenting an alternative to violent social upheaval which emphasized a pluralistic democratic society developing through peaceful mechanisms. Unfortunately the two radical extremes - left and right - attempted to undermine this middle of the road approach. Former members of the NRC feel that history has proven that the NRC was correct in predicting the growth of political violence after 1978.

As an outgrowth of the political campaign of 1978, and a growing fear of events in El Salvador and Nicaragua, Guatemalan institutions with different political loyalties and interests began to oppose decisions of the NRC which were regarded as being too far right for some and too far left for others. For the most part, the people of communities outside Guatemala City resented this situation. To them, the NRC represented their genuine aspirations and needs, a point of view that the Guatemalan government had not attended to for many years. Nevertheless, the participation of some members of the NRC in the presidential election and the events that followed it created a struggle within the Committee as other Guatemalan institutions attempted to dominate and use the Committee as a political instrument for sectarian purposes.

The second Executive Director of the Committee tried to restore the main objectives of NRC after the political campaign, but because he wished to depoliticize the Committee, he was dismissed. This struggle continued into 1981, when the NRC still faced problems created by its own Social Promotion Unit which had many politicians on its staff. In spite of the efforts of the present Executive Director and some of the coordinators to keep the Committee as non-political as possible, the NRC is still torn by internal political conflict. Although the NICU tried to protect NGOs from these problems, it did so at a very high credibility cost, both with respect to other Guatemalan governmental units and NGOs.

Another problem that the NRC faced after the election of 1978 was the loss of most of its qualified personnel. After 1981, it no longer had scientists and technicians with leadership ability, knowledge and

field experience. Most of these highly qualified people were forced to leave their jobs due to political pressures, defamatory rumors, accusations, and threats that in some instances even created risks for the lives of some Committee personnel. This lack of qualified manpower able to operate at a conceptual level produced negative feedback into programs and local communities which began to be seen as mere objects of development rather than participants in the process. Late in 1981 the NICU still had a conceptual perspective mainly due to inertia from the 1976-1979 conceptual push, but outside the NRC, especially in Europe and the U.S.A., it was well known that the original goals of community development had been transformed into theoretical exercises in planning and in satisfying the personal aspirations of some of the staff.

In 1980 and 1981 the NRC lost much of its coordinating structure and operational framework. In spite of the political problems in late 1976, 1977, 1978 and early 1979, the NRC was very effective in its activities because of its internal cohesiveness. It reached communities and solved most of the operational problems that arose. Communities were given inspiration and motivation to work. Since late 1979, however, the NRC has not had much official support from the Guatemalan government to proceed with its development oriented reconstruction plan and has depended on the NGOs to provide most of its rural community development activities.

Since 1979 NGOs themselves have faced problems caused by increased patterns of violence stemming from both guerrilla and anti-guerrilla activity. Some NGOs have frozen or closed down their activities in

areas such as El Quiché, Chimaltenango and Sololá; others have transferred projects to the eastern part of the country where minor earthquakes derived from volcanic activities frequently produced severe damage. Some have also abandoned the country altogether. The political violence which has gradually spread throughout the highlands of Guatemala since 1978 has affected development reconstruction projects in many rural areas, especially in those where there was a need to build grass roots organization. The building of grass roots participatory structures had become impossible by 1980, since such groups are regarded with suspicion by left and right alike.

Some of the personnel representing NGOs have been killed, others have disappeared, and still others have fled the country. Violence has also touched the NRC and several members of its staff, including the General Secretary and some of its social workers, have been killed. This created a very difficult situation for NGOs since the NRC as their counterpart institution in the Guatemalan government had previously facilitated their work. These incidents of violence and threats of violence have produced doubts on the part of many NGOs about the future of the NRC and about the future of their own programs in Guatemala.

Some NGOs whose programs deliberately promote social change and are aimed towards improving community organization have been watched carefully by the extreme right since these activities are seen as mechanisms against right wing political philosophies, policies and goals. There is no doubt that the extreme right wants to keep communities unorganized, dispersed and at the lowest level of human energy necessary to merely survive - in other words, in extreme poverty. On the other

hand, the extreme left also sees such NGOs as entities that improve the quality of life, strengthen community participation in productive work and provide a peaceful mechanism for grass roots development. Therefore the social and economic problems that the extreme left promises solutions for diminish and the left loses credibility. The extreme left and right are also against some other NGOs because they have stimulated development through religious organizations and church groups and these entities have been sometimes attacked conceptually, politically and physically by both sides.

Another problem has arisen because NGOs can not absolutely guarantee the Guatemalan government that persons with leftist or rightist political interests have not infiltrated into their organization. This growing suspicion of NGOs has created severe problems for some organizations who, besides being attacked by the extreme left and right, are also viewed with mistrust by some Guatemalan governmental institutions.

The NRC has attempted to minimize these problems but, with very little success. NGOs are completely aware of this situation and realize the potential risks that political infiltration or rumors of such may create for their operations in Guatemala. The NRC, and especially the NICU, is the only institution that understands most of these problems and has tried to provide as much support and protection as its meager resources have permitted, but it is failing to do so.

In addition to suspicions of rightist or leftist loyalties, NGOs are seen by some Guatemalan government institutions as intruders in Guatemala and as organizations that use their programs for political

or religious proselytism, or to transfer culture, and not to promote the welfare of Guatemala. In some cases this charge has a foundation in fact since much "aid," especially from churches, is tied to evangelism, proselytism and to religious activities, and others to the promotion of paternalism, consumerism and allegiance to foreign patterns.

The NRC, through the NICU, has tried to minimize these activities. It achieved a great success in 1978 and 1979, and some in 1980. Even so, many Guatemalan government institutions believe that NGOs overlap their activities and instead of correcting the problems through an integrated approach they criticize the NGOs and create a sense of insecurity, despair and fear. The answer of the NGOs has been to abandon programs and more rarely to give the NRC the opportunity to solve the situation.

Aside from these very serious political problems, one of the biggest problems of the reconstruction process was that there was not a National Plan for Development with time scenarios and the GSNCEP had not generated a land resources use plan for the spatial occupancy of the different regions of Guatemala. Without these basic tools, the NRC could not optimize the reconstruction process. The little planning that had been done was theoretical, economically oriented and based on unreliable information. These situations produced overlapping efforts, functions, activities and geographic coverage.

This lack of a national plan was also a reflection of feuds among the ministries who did not interact among themselves but took unilateral decisions as well as initiatives that resulted in anarchy and confusion.

Such confusion and overlapping was the rule and not the exception in urban areas where the Guatemalan government concentrated most of its housing programs. NGOs operating in the cities had to cope with this situation, especially with regard to the decisions taken by BANVI in 1979-1980. The main achievement of the NRC was to minimize that anarchy and confusion but at a very high political cost to its members.

Another problem was related to labor. The NGOs trained a good deal of labor for their projects but this labor, as soon as it was competent to carry out construction activities, left rural areas for urban ones where workers could make more money. This jeopardized the development of infrastructure in rural villages and towns. As soon as the construction pace was reduced in urban areas, this labor became available again in the rural areas, but by that time the economic resources had been invested mainly in the "cabeceras municipales" (the larger central towns outside Guatemala City).

Still another problem arose because, during the reconstruction process, NGOs were very much affected by inflation and the scarcity of materials. The Guatemalan government supported its own institutions more than the NGOs, which got less attention for their request for construction materials as well as less access to subsidized imported ones. The NRC struggled to correct this situation and attained some success.

Yet another problem was associated with overcoming the effects of geographic isolation on some communities. Initially the reconstruction process really tried to open a way to development in rural communities,

and tried to decentralize activities by helping municipal towns and large villages. It did not reach most of the small villages and hamlets at the beginning because they were not accessible and probably did not have a geographically well integrated structure that could be organized so that people could participate in development programs. As a result of their spatial diffuseness, small villages did not press the NRC and this institution failed to find a mechanism to reach these villages and hamlets.

The NRC also struggled to distribute the funds for the reconstruction process by creating programs that benefitted the less economically powerful groups like the peasants and especially Indian communities. As a result, they have achieved better levels of quality of life, goods, services and other desired commodities than they had before the disaster. This approach was carried out at a crescendo pace until 1979, when due to changes in government policies these massive Guatemalan government investments no longer reached rural communities.

After 1979, small projects with high social meaning and minimum economic investment were reduced and large projects with large economic investments and little social meaning at the grass roots level were substituted for them. Rural communities during 1976, 1977 and 1978 participated actively in the reconstruction process and they were engaged in productive activities, satisfying some of their own expectations and trying to achieve more self-realization.

During the first three years following the earthquake, the reconstruction process, in spite of all its problems, carried on a sincere effort

to create a peaceful mechanism for development but after 1979 the communities were the first to realize that changes in political factors had again begun to disrupt their culture. This time, however, political aggression was aimed at erasing their achievements by violent means. As a consequence of the political conflict, communities may lose their newly found community organization and their willingness to participate. In the end, the only witness of this sincere, but faltering attempt to achieve development might be the new physical infrastructure which provides basic services to the communities as a byproduct of a reconstruction-development process that was designed to minimize the violence during 1976, 1977, 1978 and part of 1979.

To end this chapter, it is worth saying that the reconstruction process brought massive social and economic investments to the rural communities of Guatemala up until 1979-1980. After that, the only projects with these characteristics were carried out by NGOs, but the social tensions, and later the violence, may force all the NGOs to leave Guatemala, and the NRC will not have the support to keep functioning as a mechanism to rescue the original values of the reconstruction process. If that happens, it will be the end of the reconstruction process and the communities will again have to accept paternalistic approaches, not to develop, but merely to survive until another natural phenomenon or manmade event again awakens the minds and hearts of Guatemalans and the international community to the pressing needs of the Guatemalan poor.

References

- Balcarcel, M. A. y O. R. Orellana
 1978 El Proceso de Reconstrucción de Guatemala. Ponencia del CRN al Simposio Sobre el Terremoto de Guatemala, del 4 de Febrero y el Proceso de Reconstrucción. Comité de Reconstrucción Nacional, Guatemala.
- Chavarria Smeaton, F.
 1978 Asentamientos Humanos y su Relación con los Efectos Producidos por el Terremoto del 4 de Febrero de 1976 en Guatemala. Banco Nacional de la Vivienda - SGCNPE. Guatemala.
- Ferraté, L. y Zoemia Prado
 1978 Estimaciones de la Obra Relajada por los Organismos No Gubernamentales en el Proceso de Reconstrucción. Archivos de la Unidad de Información, Programación y Planificación, Comité de Reconstrucción Nacional. Guatemala.
- Ferraté, Luis
 1979 Los Recursos Naturales de Guatemala. Situación Actual y Potencial. Facultad de Ingeniería. Universidad de San Carlos. Guatemala.
- SGCNPE
 1976 SGCNPE, Secretaria General del Consejo Nacional de Planificación Económica-Banco de Guatemala. 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.
- UICRN
 1977 UICRN, Unidad de Información, CRN. Archivos Sobre la Creación del Comité de Reconstrucción y Decretos Posteriores. Comité de Reconstrucción, Guatemala.

Chapter 5

The Disaster Related Social System

Frederick L. Bates

Introduction

The last two chapters have presented a detailed account of how various parts of the Guatemalan government were organized to respond to the disaster of February 4, 1976. They also presented a view of how the Guatemalan government saw its relationship to non-governmental organizations which were involved in the relief and reconstruction process and how it saw its posture with respect to local communities. The objective of this chapter is to present a structural analysis of this and additional material by presenting a more sociological view of the network of relationships that made up the entire disaster oriented social system. As a guide to performing this task, the structural orientation presented in Bates and Harvey's The Structure of Social Systems will be employed (Bates and Harvey 1975).

In order to present a structural image of any social system, it is necessary first to identify the social units that form the parts or elements of that system and then to specify their relationships to one another to form a network that binds them together into a larger whole. In a system as large and as complex as that which formed to respond to the 1976 earthquake, so many individual units exist that it is useful to begin by identifying segments or sectors of the larger system before

dealing with individual units. Furthermore, it is helpful to identify types of units included in the system in terms of the differential functions they perform. Finally, it is helpful to categorize the types of relationships that are likely to be found among the various parts or sectors of the system.

Complex Sub-systems Forming Sectors of the Disaster Related

Social System

The Guatemalan case brought into a state of activity an extremely complex system of human organizations and groups which were focused upon dealing with various aspects of the emergency created by the disaster and the process of reconstruction which the emergency necessitated. It is extremely important to realize that the various groups and organizations which formed the system operated in terms of a wide variety of motives and interests. Each had an implicit or explicit agenda which was related to its own interests and its own value orientations. It would be a mistake to assume that all were motivated by the common altruistic goal of helping disaster victims. While this motive was indeed widespread and honestly held by most of the units involved, it constituted only a highly abstract conception of how organizations and their individual members should feel about their obligation. When this altruistic orientation was filtered through the organizational structures and value systems of various individual units, it was translated into a variety of operational meanings and these interpretations were naturally influenced by the vested interests implicit in the nature of individual organizations and their linkage to the structure

of Guatemalan society and in many cases their linkage to other societies.

While all professed a desire to help, this desire was inevitably affected by the vested interests of the individual units who formed a complex network concentrated on varying aspects of the disaster. This situation was not unique to the Guatemalan case but is characteristic of complex disaster oriented social systems wherever they occur. The organizational participants in a disaster, as well as their individual members, always have a variety of motives and interests which are expressed in goals and objectives and translated into programs and activities. As a consequence, conflict as well as cooperation become an important part of the process which transpires as the disaster oriented social system is set in motion.

The resultant emergency relief and reconstruction processes taken as a whole, and their impact upon disaster victims, their communities and their life styles, are therefore best viewed as the outcome of both the patterns of conflict and cooperation engendered by the division of labor that evolves in the disaster related social system as it moves through the process of contending with the aftermath of disaster. This analysis of the structure of the disaster related social system will therefore proceed on the assumption that the various units and sectors that comprised the system stood in what Bates and Harvey call "conjunctive" relationships to each other.

Such relationships are characterized by a lack of identity in interests among organizations and groups forming a system comprised of

many autonomous and semi-autonomous units. Conjunctive relationships mean that although units may interact and may be oriented towards the same clientele (disaster victims or victim communities), because they are structurally separate and have their own organizational interests and objectives, deal with each other not always as partners, but often as competitors, or sometimes as adversaries. Because of this, conflict problems arise and must be resolved or mediated in order for the individual parts of the system to pursue their goals either separately or together. In addition, coordination among the programs of various independent units with differing orientations and interests becomes difficult and requires techniques particularly suited to a situation in which conjunctive relationships predominate. These points will be discussed more fully later after the sectors of the system have been identified and the nature of their individual interests and value orientations have been discussed.

For purposes of this analysis the disaster related social system can be divided into six sectors on the basis of the types of units involved and their similarity in orientation towards the disaster relief and reconstruction process. These segments are as follows:

1. The Guatemalan governmental sector.
2. The Guatemalan private sector.
3. The foreign governmental sector.
4. The foreign private voluntary organizational sector, including church groups.
5. The local community organizational sector.
6. The household and kinship networks sector.

Each of these broad sectors may be divided into sub-sectors and eventually into individual groups and organizations. Broad sectors will be discussed separately below.

The Guatemalan Governmental Sector

In the last two chapters, a detailed account of the Guatemalan governmental sector was presented. In very broad terms, it can be said to have consisted of three types of units: (1) the regular ministries of the Guatemalan government and their various standing sub-organizations, (2) specially formed ad hoc units activated to contend with the emergency and reconstruction process, and (3) disaster oriented coordination units. The overall design of the system envisioned by the President of Guatemala and the Guatemalan legislature was one in which two coordinating units or committees (The National Emergency Committee and The National Reconstruction Committee) and their associated operational arms were to operate as coordination centers through which the efforts of the various ministries, foreign governments as well as domestic and foreign voluntary organizations could be brought to bear on the emergency relief and long range reconstruction process.

The Emergency Committee had been formed before the disaster and consisted of representatives of the Guatemalan army, the Guatemalan Red Cross, the Association of Firemen, the Boy Scouts and the representatives of several governmental ministries including Interior, Public Finance, Agriculture, Communications and Public Works, Public Health and Social Assistance. It also contained representatives from the Chambers of Commerce and Industry, the Banking Association and the Newspapers. It was controlled by the army and the Ministry of Defense

and utilized the organizational structure implied by the membership of the Committee. This structure used the army, the Red Cross, local fire departments and Boy Scout troops as the operational personnel to carry out its work. Since the Red Cross operates internationally under a policy of cooperating with and working through local Red Cross units, when Red Cross help arrived from abroad it joined this network organized around the Emergency Committee.

As noted in the last chapter, the Emergency Committee was focused on emergency relief activities and had no mandate to engage in long range reconstruction. Its orientation was toward offering emergency assistance and it offered its aid free. It was not particularly concerned with involving victims in self-help, development oriented activities nor with the possible creation of dependency relationships through its activities. The Emergency Committee's approach was a charitable one and geared to quick responses. As time passed, however, it was criticized for being "paternalistic" and for seeking publicity to enhance the image of the army and of other participants as public benefactors.

Because of the special place of the Red Cross in relation to the Emergency Committee, and especially because of the Committee's orientation to giving aid, the Guatemalan Red Cross and other Red Cross societies that came to Guatemala to help remained more or less separated from other voluntary organizations who developed closer ties to the newly formed Reconstruction Committee due to its approach to community development. This whole network of organizations, formed around the

Emergency Committee, continued operations well into the reconstruction process and some, including the Guatemalan army, the Red Cross and the Boy Scouts, conducted housing programs. Thus their activities gradually moved from strictly emergency to what might be considered reconstruction activities.

The orientation of this sub-system must be viewed as being largely a product of the position it occupied in the disaster-related social system. Its mission was basically an emergency one and had short-term objectives. This emergency mission quite naturally fitted a charity orientation. In short, the structure of the network organized around the Emergency Committee and its place in the larger disaster oriented system, and not necessarily the individual value orientations of the people involved, goes far to explain this cluster of organizations' lack of emphasis on such things as community development.

In contrast, the Reconstruction Committee which was created after the disaster to plan and manage the massive reconstruction process quite naturally was sensitive to long range questions related to development. Very early in the process, officials involved in the formation of the Reconstruction Committee saw that the reconstruction process would have a great impact on social and economic development whether it was intended to or not. As has been seen, this Committee formulated policies and designed procedures that were deliberately designed to attain development as well as mere reconstruction goals.

The place that the Reconstruction Committee occupied in the structure of the disaster-oriented social system and its long-range mission and consequent orientation, inevitably brought it into conflict

with other elements in Guatemalan society and with elements of the disaster-related social system from outside that society.

It was designed to be a coordination unit which would bring together a network consisting of the regular ministries of the Guatemalan government and non-governmental organizations from at home and abroad and focus the activities of these various units on the reconstruction process. In theory it had the legal authority to require the cooperation of the various Guatemalan Ministries of State and to bind NGOs to a set of contractual obligations in conformity with NRC policy. In fact, however, this legal right was virtually impossible to translate into mandatory compliance and the Committee had to use persuasion and bargaining as its basic tools of coordination.

The various ministries of the Guatemalan government, like those of any government, were organized as bureaucracies with specific mandated missions. Like all such organizations, they were not receptive to turning over their programs to an "upstart" committee or to voluntary organizations they did not control. Nor were they eager to conform to policies which were different from their long standing operating procedures. As a consequence, they resisted the Reconstruction Committee and often gave less than full cooperation, especially when they saw their own interests threatened.

Huge programs were being contemplated and there was both political credit and private profit to be had from controlling or participating in them. The bureaucracy wanted its share of the action. In addition, these governmental units did not have the capacity to contend with either the scale or the pace of the reconstruction process but found

it hard to relinquish claims to jurisdictions that would normally be theirs. In short, they were in a defensive position with respect to NRC and with respect to the massive buildup of outside voluntary organizations that seemed to them to be running wild in the countryside. Their interests were in conflict with the interests of this newly formed Reconstruction Committee and its allies in voluntary organizations, both Guatemalan and foreign.

Again, this should not be seen as a peculiarly Guatemalan phenomenon but one which is associated with long established bureaucratic organizations when they confront an environment that is perceived to threaten their interests. The type of conflict that arose and is described in the previous two chapters must be regarded as a common outcome of the form of organization which emerges following a large-scale natural disaster.

Also included in the Guatemalan governmental sector in a more informal manner were the three independent interest groups mentioned in Chapter 3 as "The 100 Days Group," the GSNCEP group and the group formed of the field personnel from a variety of agencies. Each of these units constituted an "interstitial unit"; that is, a group which stands in between established organizations and groups and draws members from them on the basis of similar vested interests in order to bring about coordination in putting pressure on public institutions. In short, interstitial groups are coalitions designed to bring about temporary or more or less permanent alliances which can be useful to their members in furthering their own interests.

The 100 Days Group grew out of the Emergency Committee's efforts to conduct an emergency shelter program and to respond to the housing problem and at the same time to take the National Plan for Development into account. It was formed during the first month after the disaster and was comprised of representatives of groups with aspirations to control or to participate in the massive housing reconstruction program that would obviously follow the disaster.

It consisted of some members of the National Economic Planning Council, The Guatemalan Chamber of Construction, The National Housing Bank (BANVI), The Municipality of Guatemala City and The Institute of Insured Mortgages (FHA). Its public concern was with coordinating the reconstruction process with the National Development Plan. However, this plan called for the Ministries of State to conduct programs and make investments through normal governmental channels which tied various ministries to their normal clientele in the private sector. A good deal of the concern over the impact on the development plan was a concern with keeping within regular operating procedures during the reconstruction process so that the private groups represented by members of this ad hoc unit could do business as usual.

This group formulated a plan for emergency activities to be carried on during the first 100 days following February 4th, the date of the earthquake. Among other things, the plan dealt with debris clearance and demolition and recommended a shelter program through which seven sheets of lamina, along with other construction material, would be provided to 40,000 families in Guatemala City and 107,000 families in the countryside outside the city. These programs would be carried out

through regular governmental institutions including BANVI, BANDESA and the Guatemalan army. This was considered a "transitional plan" which would allow time for planning long-range reconstruction in conformity with the National Development Plan.

The 100 Days Plan Group may be regarded as an informal pressure group which sought to and did influence the policy and programs of the NEC. It was concerned with the development impact of the disaster and the reconstruction process primarily in terms of its impact on established plans for development. Its approach was therefore more traditional than innovative and the activities it recommended were to be controlled through the regular machinery of government. Nevertheless, it actually formulated operational plans that were adopted and followed for a period of time by the NLC. Its focus was primarily on urban reconstruction, especially Guatemala City.

The second group which sought to influence NEC policies and activities was the one formed by a coalition between the General Secretariat of the National Council of Economic Planning (GSNCEP), the Bank of Guatemala, and the Ministry of Finance. This group's usual responsibility was for the formulation of national development plans, and for monitoring indicators of economic development. It was comprised primarily of economists, bankers, and experts on finance and was concerned about the impact of the disaster on carrying out the development plan for Guatemala. Since it was given responsibility by the President of Guatemala for estimating damage and loss and for carrying out negotiations to secure and legalize foreign loans to aid in reconstruction, it was in a potentially powerful position to influence NEC and

later NRC policy. In addition to these responsibilities it had been assigned responsibility to "coordinate" foreign technical cooperation and to "adjust" the national plan for development to take reconstruction needs and activities into account.

In the long run this group did not propose exact operational plans but engaged in general economic analysis and planning which was regarded as being of little immediate value to NEC members who were responsible for immediately carrying out relief programs. Conflict arose between it and the NEC because of its failure to produce specific operational recommendations and it appears to have had relatively little effect on the planning and conduct of actual programs. Because it represented financial and business interests as well as governmental financial institutions, its approach to reconstruction tended to be conservative and to favor reconstruction by massive publically financed, but privately executed, reconstruction programs. It had minimal concern for such issues as community development or for the social consequences of public programs.

The third group was a loose confederation of field representatives from various agencies who were conducting development programs of one sort or another when the earthquake occurred. This group was quite naturally interested more in the form of reconstruction programs at the operational level than in high level economic theories. They also saw the process of reconstruction as a golden opportunity to put their ideas concerning development at the grass roots into effect in a situation where massive resources would be available and a maximum opportunity for success would be present.

Individually and collectively they pressured their own agencies, and especially the top levels of the Guatemalan government, to form a Reconstruction Committee that would promote development as a part of reconstruction. In the long run, many of this group assumed roles in the newly formed Reconstruction Committee and helped shape its policies and practices which were carried out through the complex system of sub-groups and units that made up the Reconstruction Committee's organization.

At the local level one of the most important developments in the Guatemalan disaster experience was the formation of local emergency, and later, reconstruction committees. In established communities, these groups blended together local governmental officials and elected grass roots leaders, and in the newly formed urban neighborhoods of Guatemala City they created entirely new local organizations capable of pursuing self-defined development goals.

Although these committees were in a sense an arm of the central reconstruction or emergency committees, they also represented the people and became the vehicle through which they could put pressure on the national government and its various agencies, as well as upon foreign voluntary agencies working within their communities. They, therefore, represented important interstitial groups that coordinated and managed local programs, acted as pressure groups, resolved conflicts, and perhaps most important of all, acted as training schools for the development of local leadership and organizational capacity. Since the representatives of the people were elected and represented the interests of their constituents, they also served as a testing ground for and

demonstration of democratic non-paternalistic procedures at the local level.

It would be a mistake to conclude that these committees resulted only in harmony and cooperation. They also created a vehicle through which conflict was carried out when several factions were in disagreement or when local ideas and preferences were at odds with the practices of voluntary or governmental agencies. The conflicts that arose, however, must be regarded as performing positive functions with respect to insuring greater local autonomy, cultural appropriateness, and independence. Of course the various arms of government, and often the voluntary agencies, at times had difficulty seeing this positive aspect of this arrangement when conflict seemed to be getting in the way of achieving agency goals.

There is still another side to the local reconstruction committees. In many cases, they brought local officials and representatives of the people in closer contact than ever before. This should have had a long range effect, at least in some cases, by making local government more aware of the aspirations of local citizens, and of their ability to help the community cope with problems, given the opportunity to do so. Whether the benefits of this contact will have its promised positive effect is problematic at the moment, however, because of the armed conflict going on between the central government and the guerrilla movement which has totally disrupted many of the communities touched by the disaster.

The Guatemalan Private Sector

In a major disaster which is followed by a massive reconstruction

process, involving the expenditure of hundreds of millions of dollars, the private sector inevitably becomes interested. The private producers of products and services which may potentially be consumed in the reconstruction process stand to make enormous profits, even while performing a valuable public service. As a consequence, they are interested in how reconstruction will be carried out, and quite naturally favor the use of the same mechanisms whereby ordinary public works programs are conducted. They are not as likely as voluntary organizations to view development as a process that takes place at the grass roots level, but instead, to see it as a process that strengthens the ability of the formal economy to produce products and services and thereby to offer jobs and spin-off economic and social benefits to the rest of the society.

In particular, those private firms who produce or sell construction materials, or who are in the construction business or in real estate development, have an interest in participating in the reconstruction process as profit-making organizations. They are likely to see the disaster related demand for materials, and the shortages that develop, as well as the need for large scale construction projects, as an unparalleled opportunity to make a profit.

It is quite natural that such organizations would view housing reconstruction from the perspective of their normal operations and to favor building large scale housing developments using normal commercial construction methods which essentially call for building by a contractor rather than by the eventual tenants. Such a process, they believe to

be more orderly and to result in higher quality construction because it is done by professionals rather than amateurs. Such procedures are also less likely to upset the standing balance of power that exists among regular segments of the society.

These interests placed pressure on the Guatemalan government to be included in the reconstruction process and used their ties to the regular government bureaucracy to further their cause. Eventually some large scale housing developments were built this way, but more often private companies contracted for large scale public reconstruction projects such as for the construction of hospitals or governmental buildings in the large urban centers, or highways and bridges, and so forth.

For the most part, the construction of housing was conducted by private voluntary organizations, with the help of the Reconstruction Committee, BANVI and BANDESA, usually with the participation of local people who supplied their labor and at least a minimum degree of managerial participation. This was even more characteristic outside Guatemala City than inside it where a few "private" projects were carried out.

Foreign Governmental Sector

Foreign governments who maintained embassies in Guatemala offered government-to-government aid and also helped finance the relief and reconstruction activities of various voluntary organizations to whom they were tied. Although governments such as that of the United States, normally offer emergency aid to foreign countries, especially those in the third world, out of humanitarian motives, they also have foreign

policy objectives and shape their aid to promote these goals.

Each nation has its own characteristic method of working in a foreign country and there is neither enough space nor sufficient inside information to discuss how each works here. Instead, the United States will be used as a case study.

The United States most often funds development programs in foreign countries by working through private voluntary organizations that have long-standing relationships with U.S. AID in various parts of the world. Instead of conducting the development programs itself, the U.S., through its embassies and U.S. AID, contracts with these agencies to manage and operate programs. Things become even more indirect because many of the large organizations they fund, such as CARE or Catholic Relief, also act more or less like funding agencies and work through existing local institutions and governmental bureaus to carry out their programs. In particular, food programs are organized in this fashion as are the many related programs that are attached to them. Thus, large voluntary organizations, often with international mandates, act as intermediaries between the U.S. government and the people served by development programs.

When an emergency arises, funds are normally made available through Congressional appropriation to offer both direct government-to-government assistance and to fund voluntary agency programs related to disaster needs. In the Guatemalan case 25,000,000 dollars was authorized for these purposes. Some went directly to the Guatemalan government for road repairs, debris clearance and the like, and some went for food and housing programs conducted by voluntary agencies or by a special staff

hired by AID to conduct a lamina distribution program.

In addition to these things, the Embassy, through the Foreign Disaster Assistance Office and other channels, arranged for assistance such as helicopters, emergency medical teams, field hospitals, road building equipment and personnel, and so forth. These activities eventually involved various agencies of the U. S. government in the disaster, theoretically under the coordination of the Embassy and the U. S. Foreign Disaster Assistance Office.

It can be seen that there was a complex web of organizations and groups organized around the U. S. participation in the emergency and later the reconstruction process. This web was in contact with the Guatemalan government through its regular ministries and officials and through the Emergency Committee, and later The Reconstruction Committee. On the other hand, it also was in contact with other governments, and with various international voluntary agencies operating in the country. The complexity of the network is too enormous to explore here. In fact it was so complex that only fragmentary data could be collected on it during the course of this study.

One important variation occurred in the Guatemalan earthquake in the normal operating procedure for U. S. programs abroad. A housing program, which will be discussed later, involving the subsidized sale of corrugated sheet metal roofing was actually conducted by personnel hired particularly for the purpose, rather than being conducted through voluntary agencies as would usually be the case. This program itself required that a distribution network be established and managed, thus creating a rather complex set of organizational ties which led indirectly from U. S. AID to cooperatives in various communities throughout the disaster area.

In connection with this program, an informal coordinating body was established between various agencies engaged in housing programs in the countryside. This group met weekly during the early days of reconstruction to iron out problems and exchange information. Although it was initiated by U.S. AID personnel, it was quickly made into a separate, non-aligned coordinating body for all voluntary agencies willing to participate. Before further discussion of this group, it is necessary to conceptualize the voluntary organizational sector of the disaster related social system.

Voluntary Organizations

Several kinds of voluntary organizations participated in the massive disaster related social system. It will be useful to classify them into four types, as follows: (1) emergency relief organizations, (2) development agencies, (3) church groups with basically religious missions, (4) ad hoc organizations and committees. Each type had its own orientation towards its role in the aftermath of the disaster. As a consequence, numerous disagreements arose over what was really needed in the way of aid, and how aid should be delivered.

Emergency oriented organizations, as pointed out earlier in the discussion of the Emergency Committee, tended to see their roles in relatively specific terms and to have short-range objectives. Their concern was with the immediate alleviation of suffering and with stabilizing the disaster situation so that the society could begin to function "normally" once more. Such organizations saw their presence, at least as active participants in post-disaster activity, as being

temporary. With respect to issues like housing they saw themselves as providing emergency shelter, or at the most, furnishing temporary housing in contrast to conducting long range permanent housing programs, especially where such programs had development as well as reconstruction objectives. The International Red Cross and The American Red Cross normally define their roles in this manner. Their international responsibilities are so extensive, and their commitment to disaster relief so constant, that they can not normally focus on one specific disaster over a long period of time but are forced to contend with a given emergency and then to move on to the next. The Salvation Army, under most disaster circumstances, operates in much the same manner, although, being a religious group with a special focus on the poor and indigent, its objectives go beyond disaster relief in and of itself.

In the case of both of these organizations in the Guatemalan disaster, obligations beyond ordinary emergency functions were assumed. Various national Red Cross societies, such as the Norwegian Red Cross and The Swiss Red Cross, assumed responsibility for and conducted permanent housing programs. The Guatemalan Red Cross, supported by International Red Cross funding, cooperated with the American Red Cross and the Mennonites to construct over 10,000 temporary houses for disaster victims. The Salvation Army, which had not operated a program in the country at the time of the earthquake, arrived to carry out its normal emergency activities, but eventually took charge of permanent housing reconstruction in Tecpan Guatemala. This was the first time it had been involved in such a program anywhere.

The second large block of agencies consisted of those organizations that were already conducting development programs of one sort or another in the country and of similar organizations that came to Guatemala for the first time to offer disaster assistance. These organizations vary considerably in their orientation to the development process and have widely different philosophies as to how to perform development tasks. They also vary from those which are very small to those which are very large and carry on large-scale operations. Included under this heading in the Guatemalan case were such agencies as CARE, Catholic Relief, Church World Service, Save the Children, The Christian Children's Fund, OXFAM, World Neighbors, PLENTY, etc. Many agencies falling in this group have a religious base of support, while others are funded by individual charitable donations, as well as governmental funding. All carry on programs not exclusively oriented towards disasters, but towards some form of development objective.

There is a division among these agencies which is drawn in terms of the conditions under which they normally deliver aid to their clientele. Some have a strong "charity" orientation and are committed to helping the needy through the delivery of free aid such as food, or cash payments to assist in child support. These free aid programs are normally tied to educational activities and health and fertility control efforts aimed at development objectives. The commitment to a charitable orientation stems partially from an ideological position, frequently with strongly associated religious convictions and partially from the funding base of the organization. Funds are obtained from donors, with the understanding that certain types of aid will be given to the poor in a specific country, or in developing countries in

general. The donors understand that they are helping to feed a poor child, or to buy clothes or pay expenses associated with education or health. The organizations therefore feel that they can not place conditions on their assistance which are in conflict with this understanding with their donors. For this reason, such organizations as CARE and Catholic Relief, and for that matter, The Red Cross and Salvation Army, approached housing with a reluctance to charge even a nominal price for aid or to place other major conditions on its receipt that would stray too far from their normal charitable orientation. It is difficult and perhaps unfair and misleading to make a single statement summarizing the orientation of this group of organizations. Nevertheless, it might be said that many believe that development depends on first solving the hunger, health and educational problems of the poor, thus providing a firmer basis for other development activities.

There is a second group of development agencies whose orientation is strongly centered upon self-help, extension education and technical assistance. These agencies are likely to be operating programs in agricultural development or the development of small-scale industry or vocational training and to focus on problems such as marketing or the formation of cooperatives and the strengthening of community organizational infrastructure. In a sense, their programs are forms of extension education backed up by appropriate technical assistance. They do not normally offer direct financial aid to the poor or distribute products such as food, clothing or housing materials. Instead, they focus on raising the consciousness of their clients and on improving the capacity of a community to manage its own affairs or

on the capacity of individuals and households to produce income and to fit into a marketing system. The expenditures of such organizations go more for supporting personnel who carry out the program in the field, rather than into subsidies for the clients. The Peace Corps and such groups as World Neighbors, or PLENTY fall into this category.

This type of organization often takes the view that charity produces dependency and therefore programs that give money or commodities to the poor undermine the development process. When organizations in this category organized disaster relief and reconstruction programs they therefore required recipients to make some sort of contribution either monetarily or in the form of labor. For example, some sold lamina and other building materials to disaster victims at half price, and conducted extension education programs on how to build safe houses using locally available materials. Since some were operating agricultural development programs, they saw free food distribution as a threat to their programs. They felt that the massive distribution of free food would depress agricultural prices and act as a disincentive to agricultural production as well as preventing farmers from making money during the immediate post-disaster period needed to assist them in reconstruction.

This group also tended to oppose the notion of building whole houses in large housing programs on the grounds that many of the houses being built were believed by them to be culturally inappropriate and to be too expensive, given local resources. Furthermore, such programs

were viewed as "paternalistic" since local people often had very little to say about their design, or their construction.

As a consequence of these differences in objectives, funding sources and philosophies of development, conflicts arose among voluntary agencies during the reconstruction process. These conflicts expressed themselves in both private and public criticisms as well as in occasional confrontations at meetings. More importantly, they resulted in some compromises which led charity oriented organizations to emphasize victim participation in the construction of housing to conform to the Reconstruction Committee's policy that aid not be given away free. Thus organizations such as The Red Cross and The Salvation Army, as well as Church World Service and many others, required victims to contribute their labor, where possible, to house construction or community projects to qualify for receiving housing aid. CARE required conformity to nominal housing design standards, and the building of a frame for a house by organized groups of victims before it donated roofing materials. In addition, most of the food eventually distributed to disaster victims was distributed through food-for-work programs that had self-help objectives.

Nevertheless, aid programs differed widely from agency to agency and frequently competed with each other in the same town. For example, roofing materials were sold at half price by one agency and given away free by another in the same village. Or, some people might receive food free while others were required to work for it. One of the most important decisions of the Emergency Committee, and later the Reconstruction Committee, was to assign specific voluntary agencies to particular

communities or sets of communities. This decision cut down on inconsistency in programs within communities to a certain extent, but resulted in substantial differences between communities in the types of reconstruction programs carried on. In addition, some very large agencies who had programs extending across much of the entire country at the time the earthquake struck continued to operate on a more or less country-wide basis. This meant that their programs might be carried out in the same or nearby communities where other agencies were conducting programs using an entirely different organization and philosophy.

The Coordination Committee of Voluntary Agencies initiated by U.S. AID and continued on a nonaligned basis, included only some of the voluntary agencies. In particular, it was dominated by those agencies whose programs were based on the second orientation discussed above, namely a "self-help" orientation. It also had higher participation on the part of middle sized and small agencies than the larger country-wide programs. For the most part, emergency oriented organizations did not participate. Their attachment, however, was more to the Guatemalan Emergency Committee than to the Committee on Reconstruction.

Religious Groups and ad hoc Committees, etc.

In addition to the larger more development oriented groups with religious affiliations and backing such as Catholic Relief, Church World Service, The Salvation Army and various Mennonite groups normally engaged in development and disaster relief, a fairly large number of

other church affiliated groups sent aid, and along with it, missionaries. Many such groups offered assistance ranging from houses, housing materials, to food and clothing on a charitable basis. Their interests, however, were often focused upon making converts and used disaster related activities as a mechanism to do so. New churches associated with various evangelical sects sprang up in villages and towns where they had not been seen before.

In a similar fashion many newly formed disaster relief groups showed up on the scene offering themselves as volunteers or promising various forms of assistance. An unusually large number of medical personnel were among these volunteers. Many remained in Guatemala long after the disaster related medical emergency was over and attempted to deal with health conditions in general in relatively remote areas of the country. Most eventually left voluntarily or were forced to leave once the Guatemalan health establishment began to insist that they be licensed to practice like all other health personnel in the country.

There were also the opportunists who saw the disaster as a way of raising funds which would never find their way into the reconstruction process. In addition, there were those who were sincere in their desire to help and who had formed committees or groups, especially in the U. S., but were not properly incorporated back home to be non-profit organizations. Some such organizations lasted only long enough to be assigned to communities, to make extravagant promises as to what they would do, and then to disappear, never to be heard from again.

Added to the above were the disaster scientists studying earthquakes in the physical and social sense, taking part in the complex web

of activities constituting the system. Also included were the disaster consultants who were called in as experts to advise agencies on the design of programs. These included both academics and members of commercial consulting firms. Representatives of manufacturing and commercial firms in the business of selling emergency shelters, modular houses, or other "hardware" likely to be needed in the reconstruction process also came to Guatemala. Finally, of course there were the curious who came more or less as tourists just to see what had happened. All of these assorted individuals and groups blended into and interacted with other units making up the disaster related social system.

The voluntary agency network was loosely tied to the Reconstruction Committee by written contractual agreements which spelled out in some detail what each agency promised to do. Through these agreements individual agencies were allocated responsibility for reconstruction programs in particular communities or geographic areas. These documents also gave the agencies legal authority to operate in these assigned areas.

In particular communities, agencies were theoretically subject to influence, if not a degree of control, by local reconstruction committees with whom they were expected to consult on the design and execution of programs. In practice, the degree of consultation varied considerably, in some cases being very intense and in others virtually nonexistent. In a few instances, conflicts arose between local committees and agencies which kept certain local programs in a turmoil over many months.

In addition to the local reconstruction committees there were roving field teams representing the National Reconstruction Committee that

periodically monitored agency programs and reported on them to headquarters. This could occasion consultation between the NRC and agency personnel over problems in the execution of programs at the local level.

It can be seen from this discussion that there was a network of connections which tied agencies to the local community and their clientele, disaster victims, on the one hand and to the National Reconstruction Committee on the other. There was also a network which led from agency programs in particular communities to agency headquarters in Guatemala, most frequently in Guatemala City or Antigua, and from there often to a regional headquarters, and finally to their central office, usually located in a foreign city, for example New York or London. From thence the network spread out to incorporate the donors and sponsors of the agency. Donors often consisted of individuals or church congregations and groups. Program sponsors often consisted of foreign governments and their various ministries and bureaus. For example, much support for U.S. based voluntary organizations comes from U. S. AID.

This sponsorship network had definite implications for the form that programs took, as noted above, because sponsorship is usually attained on the basis of a commitment to operate certain types of programs in a certain manner. But the point to be made here is that feedback information had to flow back through agency channels and eventually to sponsors so that funds could be raised to support programs and this feedback had to reflect the agency's commitment to its sponsorship as well as its accomplishments with respect to its client's

disaster victims. This has the long range implication of binding agencies to a pattern of operation which has proven successful in obtaining support on the one hand and delivering services on the other. Actual field programs in a sense may be viewed as an outcome of long range experimentation which finds a successful formula for maintaining this delicate balance. Because of their position in a network of organizational commitments, local program directors and field personnel often do not have a great deal of freedom to innovate. They are tied to disaster assistance strategies and development philosophies that fit the structural niche they occupy in the voluntary agency segment of a now global system of related, sometimes cooperating, sometimes competing, multinational organizations.

It must be understood therefore that much of what took place in the reconstruction process was decided far away in organizational headquarters, often on the basis of policies which apply to all local programs carried out by large scale agencies with programs operating in many parts of the world. As a consequence, much of the conflict between charity oriented and self-help oriented development agencies is structural in character and has very little to do either with the Guatemalan case in particular, or with the personalities representing various agencies in this particular case.

Community and Household Level Units

Communities affected by the disaster varied from very small isolated villages and hamlets to large municipios and departmental capitals and finally to a large portion of Guatemala City, a giant primate urban center. Except in the smallest places there was,

of course, a local governmental structure and often offices representing various ministries of state and nationally organized bureaus. In the larger places there were educational institutions, health facilities, many churches serving various religious sects as well as business establishments. All of these local institutions became factors in the reconstruction process, some as active participants in the process itself, and some as the recipients of assistance from the system. Government buildings, churches and schools, health clinics and hospitals, businesses and public utilities were all affected by the disaster and had to be repaired or replaced either by their owners or members, or by those who came to aid.

In other words, individuals and households were not the only "victims" of the disaster, nor were agencies, both Guatemalan and foreign, the only actors in the reconstruction process. The whole organizational infrastructure of communities was a part of the disaster related social system.

It must be noted also that interpersonal networks organized around kinship or around neighborhood and friendship relationships became involved in relief and reconstruction. Victims did not simply stand and wait to be assisted by agencies but the regular social networks through which people normally help each other in time of need or crisis were activated and rescued victims, sought medical attention, provided temporary shelter, and began reconstruction. It was these networks that many agencies attempted to join up with in an attempt to combine self-help with outside aid to maximize the developmental impact of the reconstruction process.

Summary and Conclusions

The changes in Guatemalan society at the household, community and national level that can be attributed to relief and reconstruction following the earthquake must be seen as the results of the operation of a very complex system of intermeshed activities carried on by hundreds of organizations and agencies, as well as by thousands of subsidiary field units operating in hundreds of damaged communities, each with its own internal organization. The reconstruction outcome must be seen as being the result of the interaction between these various units in the context of a geophysical and geopolitical environment. This interaction was as much characterized by interorganizational rivalry, conflict and competition as it was by cooperation and mutual assistance. Both conflict and cooperation are natural processes in such a system and both have positive and negative consequences for the attainment of disaster recovery or of development goals. Conflict may at times produce new ideas, and force creative compromises and at others produce destructive and debilitating effects on the functioning of a system such as this. Likewise, cooperation may forge alliances against change and adaptation just as easily as it can magnify the creative force of mutual assistance. It is therefore ill-advised to view the lack of internal consistency and unanimity on goals, objectives and operating procedures observed in the Guatemalan case, or the case of any other disaster as a sign of weakness in the reconstruction process. Indeed it may be exactly the opposite, a sign of adaptive change in disaster related social systems themselves.

References

Bates, Frederick L. and Clyde C. Harvey
1975 The Structure of Social Systems, New York: Gardner Press,
Inc.

Chapter 6

Emergency Food Distribution and its Appropriateness

Frederick L. Bates, Daniel G. Rodeheaver

and

Robert E. Klein

Food Shortages

During the household interview conducted two years after the earthquake, household heads were asked a number of questions concerning emergency food programs. These questions were designed to elicit information concerning a wide range of topics associated with the post-disaster food problem. In particular, they were aimed towards determining (1) whether or not a food shortage existed, and for whom it existed, (2) how long the shortage lasted, (3) who received emergency food, (4) what kinds of food they received, and (5) what impact these emergency food programs had on food prices and on the production of food in subsequent years. The data obtained from these interview items will be analyzed in this report.

Critics of emergency food programs following the earthquake believed that there was no real shortage of food in Guatemala after the disaster in the sense that there was not enough food on hand somewhere in the country to feed disaster victims. They believed that the food problem lasted only a few days and was due primarily to a temporary disruption of the distribution system. Once people recovered from the initial shock of the disaster

and could dig out their food supplies and resume marketing, the food problem was over. Emergency food distributed after the first week or so therefore was seen as competing with the normal economic system of the market.

Perception of Food Shortage

In the first interview for the earthquake study, people were asked several questions about their perceptions of the food problem in an attempt to discover the extensiveness of the shortage. The answers to these questions shed some light on the controversy over the need for emergency food.

Household heads were asked the following question: "After the earthquake, was there a shortage of food here in this house?" Interviewers emphasized to the respondents that they were asking about a shortage caused by the earthquake and not about a shortage of food due to normal economic conditions. In other words, the question referred to a more than normal shortage, attributable to the disaster. Table 6-1 gives the results of this question.

TABLE 6-1

Food Shortages Reported in Individual Households Following the Earthquake

	<u>Control*</u>		<u>Experimental</u>		<u>City</u>		<u>Total</u>	
	<u>#</u>	<u>%</u>	<u>#</u>	<u>%</u>	<u>#</u>	<u>%</u>	<u>#</u>	<u>%</u>
<u>Food Shortage</u>								
No	424	74.00	175	21.79	73	22.81	673	39.66
Yes	149	26.00	628	78.21	247	77.19	1024	60.34
TOTAL	573	100.00	803	100.00	320	100.00	1697	100.00

* The control group sample has been reweighted throughout this and following chapters so that it includes the same number of department capitals, municipios and aldeas as the experimental group. This is why the Ns are higher than indicated in the sampling tables in Chapter 2.

These data show that in the experimental group (damaged communities in the earthquake zone) over 78 percent of the respondents reported an earthquake related food shortage in their homes. In contrast, in the control group (undamaged communities outside the earthquake zone) about 26 percent reported a food shortage. In both experimental and control communities a carefully selected random sample of households was interviewed. These results may be regarded as reasonably representative of these two areas. In the city, where a special sample of reconstruction housing neighborhoods was studied, the sample is not representative of the whole city. Instead it consists of a random sample of households from four large reconstruction project areas where the populations are entirely comprised of relatively low income people who moved into these areas following the earthquake and were believed to be people who lost their previous dwellings in the earthquake. In this city sample which is biased towards lower socio-economic status and towards people suffering heavy loss in the earthquake, around 77 percent reported earthquake related food shortages.

The question arises as to how to interpret experimental-control group differences in reported food shortages - especially how to interpret the 26 percent in the control group who reported a shortage when they would not be expected to do so since they were outside the heavy impact area of the earthquake. There are several possible interpretations of these data. First, there is the possibility that the earthquake caused disruptions in the food distribution system, not only inside but outside the area of high earthquake impact. If this occurred, then earthquake related shortages would be felt in the control group area which is on

the immediate fringes of the earthquake impacted zone. A second possibility is that respondents were unable to distinguish between earthquake related "acute" shortages, and normal poverty related "chronic" shortages. As a consequence, a certain portion of the respondents who are always short of food would report a chronic shortage as an earthquake related acute one. This would occur in both the control and experimental groups and make the earthquake related shortage look much larger than it really was. Using this interpretation, the 26 percent in the control group reporting a shortage may represent the proportion of people who are, at any given time, chronically short of food. If it is assumed that a similar proportion of people in the experimental group are making the same error, then the proportion in the earthquake area reporting earthquake related food shortages should be reduced by some factor related to this control group figure.

It is not immediately apparent, however, that the over estimate in the experimental group proportion is by 26 percent. For example, a family could suffer both chronic and acute earthquake related shortages. Thus, if a normal 26 percent suffer chronic shortages, and as many as half are affected by the earthquake and experience further earthquake related shortages, then the over estimate is more like 13 percent than 26. Using this sort of reasoning, it would appear that at the least, 65 percent of the households in the earthquake impacted area suffered earthquake related food shortages and perhaps as many as 78 percent did so. This compares to at most 26 percent in the control group and, considering the possibility that half of these were reporting chronic food shortages, as few as 13 percent. There is really no way to know how to correct these figures exactly, but it is apparent that many more

people in the earthquake zone reported food shortages than in the control group. This can be interpreted only one way. People there believed in greater numbers that food shortages caused by the earthquake existed.

There is a third possible interpretation. It is possible that informants were telling interviewers what they thought was a reasonable answer to this question regardless of what the facts actually were. In other words, a respondent might think, "It stands to reason that an earthquake would cause a food shortage. Therefore, the correct answer to this question is 'yes.'" A further extension of this idea for the control group might be that, "Since the earthquake didn't affect this town, then the correct answer is 'no.'" The trouble with this interpretation is that it may explain the yes answers in the experimental group and the no answers in the control group which are regarded as "correct" answers but it fails to explain those who gave the other answers - nearly a fourth of all respondents. Furthermore, there really is no justification for assuming that people in the control and experimental groups would think that different kinds of answers were appropriate for them to give to the same question. They didn't know that they were being treated as a control and experimental group.

The most reasonable interpretation of these data is that actual food shortages did exist as a result of the earthquake and affected around three-fourths of the people in the earthquake affected area to some degree. It is important to remember, however, that responses to this question only indicate a shortage and do not measure either its severity or duration. Furthermore, they do not touch on what foods were in short supply. These topics will be examined later. Meanwhile it will be useful to look at

how different areas of the country and different types of communities and ethnic groups were affected.

Table 6-2 gives data on food shortages by different types of communities in the experimental group. This table shows that there was little difference between various kinds of communities in the proportion of people who reported food shortages in their homes. As a matter of fact there is no statistical difference among them. All show that between 77 to 79 percent of the households reported food shortages.

Table 6-2

Food Shortages in Households Classified by Political
Status for City and Experimental Group

Political Status	Food Shortage				Total	
	No		Yes		#	%
	#	%	#	%		
City	73	22.81	247	77.19	320	100.00
Dept. Capitols	49	22.07	173	77.93	222	100.00
Municipios	86	21.18	320	78.83	406	100.00
Aldeas	41	23.30	135	76.70	176	100.00
TOTAL	247	22.01	875	77.99	1122	100.00

When Indians and Ladinos were compared, it was found that 80.6 percent of the Indians and 76.5 percent of the Ladinos reported food shortages in their houses. This difference, however, is not statistically significant. Similar non-significant differences occur when the experimental group is divided into regions. In the East 76.4 percent reported food shortages

as compared to 79.1 percent in the Highlands west of Guatemala City. Furthermore, when the contrast between Indians and Ladinos was done holding region constant, the same results were obtained. There were no significant differences between the ethnic groups in the number of households reporting food shortages.

In summary, the number of households in the experimental group reporting food shortages seems to be unaffected by the type of community they live in, or by the ethnic group or region of the country. The only significant statistical difference is between the experimental and control groups. A much higher percentage of people reported food shortages in the earthquake affected area than in the unaffected area. The conclusion that earthquake related food shortages existed in the earthquake area for about three-fourths of the households seems inescapable.

Duration of Food Shortage

While there seems to have been a definite food shortage throughout the earthquake affected area, the question arises as to how long it lasted. A shortage of a few days would have far different significance for earthquake food relief than one of several months, especially since many weeks were required before the bulk of Public Law-480 foods were delivered in Guatemala.

Table 6-3 shows the results of a question asking people how long the food shortage lasted in their individual households. In the experimental group 631 households reported food shortages. Of these, 18 percent reported they lasted less than 2 weeks. If the 26 percent that reported the shortage lasted two to four weeks are added to this, it is seen that around 44 percent said the shortage lasted less than a month and the

remainder (56 percent) said it lasted longer. Only 20 percent said it lasted longer than three months. Since much of the PL-480 food was distributed more than three months after the earthquake, it can not be regarded as meeting the emergency need for food caused by the disaster for around 80 percent of the disaster victims. It would have, at most, served the needs of around 20 percent of those who reported a food shortage, or around 16 percent of the population of the disaster area. It might also be regarded as serving other purposes associated with reconstruction since much of it was distributed in food for work programs.

TABLE 6-3

Length of Food Shortage for those Who Perceived
a Food Shortage Only

All Communities	Total		City		Experimental		Control	
	#	%	#	%	#	%	#	%
Less than 2 weeks	195	19.02	59	23.89	116	18.38	20	13.65
Two to 4 weeks	294	28.63	74	29.96	165	26.15	55	36.91
One to 2 months	178	17.30	47	19.03	116	18.38	15	9.84
Two to 3 months	117	11.39	27	10.93	70	11.09	20	13.42
Three or more months	185	18.05	33	13.36	127	20.13	25	17.00
No information	58	5.62	7	2.83	37	5.86	14	9.17
Sub Total	1027	100.00	247	100.00	631	100.00	149	100.00
Missing (no food shortage)	670	-	73	-	173	-	424	-
TOTAL	1697		320		804		573	

This 16 percent however, is a rather large population consisting of as many as 240,000 people, assuming that the disaster area outside Guatemala

City contained one and a half million residents. Later in this report the amount of food delivered relative to the population in need will be examined in detail. For the moment, however, it appears that a large proportion of the food aid arrived after the most acute stage of the food shortage had passed. This seems to show that the shortage was solved in part by the distribution of what emergency food was available during the first three months following the earthquake and by the resumption of normal food distribution activities that were restored relatively quickly following the disaster.

Table 6-3 also shows that the reported shortages in the control group were on the whole of shorter duration than in the experimental group. There, slightly over half lasted less than a month and only 17 percent more than three months. Similarly in the city for the special sample there, the food shortage was of shorter duration. There 54 percent reported shortages of less than a month and only 13 percent reported shortages of more than three months. These facts seem to point to a quicker restoration of normal marketing in the city and in undamaged areas and to a quicker distribution of emergency food in the city through which virtually all international food relief flowed as it was dispersed into the countryside.

Results of Second Survey Regarding Food Shortages and Food Distribution

In order to help with the interpretation of results from the first interview, which was conducted about two years after the earthquake, questions were included in an interview conducted with a sub-sample of 256 households taken from the original 1472 households studied. This

interview was conducted approximately one year after the first one. The sample included only experimental group families, and because of problems there, included every experimental group and city community but Chimaltenango.

Respondents were asked, "Do you think that after the earthquake there was sufficient food here and it was not necessary to bring any in from outside the community?" If respondents thought there was sufficient food they answered by strongly agreeing or agreeing with the statement and the opposite if they did not. The results of this question are given in Table 6-4.

These data generally agree with those obtained from the earlier survey. About 88 percent of the interviewees disagreed with the statement that there was sufficient food in their communities after the earthquake and only about 12 percent agreed. Unlike the earlier question which asked about shortages in the respondent's particular household, this question asked whether there was enough food present in the town they lived in. In this case, however, there is no possibility of estimating the length of the shortage since no such question was asked in the second interview.

The same respondents were asked to agree or disagree with the statement, "More food was given away in this community than was needed." This question was not asked if no food was given away in the community. The results are given in Table 6-5. These data show that almost 86 percent disagreed with this statement, indicating that they did not feel too much food was given away in their particular communities. A substantial minority of around 13 percent, however, felt that too much food was distributed.

When these results were examined for the type of community, that is, departmental capitols, municipios, aldeas and city neighborhoods, no

TABLE 6-4

Perceptions of Food Shortages in a Sub-sample of
Experimental Group Households Three Years After the
Earthquake

There was enough food in this community. No outside aid was needed.

Answer Category	No.	%
Strongly Disagree	52	20.5
Disagree	171	67.3
Agree	30	11.8
Strongly Agree	1	0.4
TOTAL*	254*	100.0

*Two persons did not answer this question.

TABLE 6-5

Perceptions of Whether Food Distribution was
Excessive or not in a Sub-sample of Experimental
Group Households Three Years after the Earthquake

More food was distributed in this community than was needed.

Answer Category	No.	%
Strongly Disagree	38	15.8
Disagree	170	70.8
Agree	32	13.3
Strongly Agree	0	0.0
TOTAL*	240	100.0

*Sixteen people were not asked this question because food was not given away in their community.

significant difference was found. In other words they seem to apply across areas of the country and types of communities.

These two questions and those from the first survey seem to indicate clearly that the people of the earthquake area, on a whole, perceived a definite food shortage, and that they did not feel free food distribution was inappropriate.

During the same survey with a sub-sample of the original respondents, a question related to peoples' opinions of free food distribution was also included. People were asked, "Do you think that such things as food, clothing and houses should not be given away to people affected by a disaster?" Table 6-6 shows the distribution of answers to this question.

TABLE 6-6

Answers to question: Do you think that such things as Food, Clothing and Houses should not be Given Away to People Affected by a Disaster?

	<u>Number</u>	<u>Percent</u>	<u>Cumulative Percent</u>
Strongly Disagree	87	34.1	34.1
Disagree	149	58.4	92.5
Agree	18	7.1	99.6
Strongly Agree	1	0.4	100.0
TOTAL	255	100.0	100.0

Over 92 percent of all respondents disagreed with this statement, indicating that they approved of giving disaster victims such things as food. Presumably if food distribution had a negative impact on their incomes, they would have responded in the opposite direction.

Self-Sufficiency in Food as a Measure of Need

A number of questions were asked during the course of the household survey that allow an estimate of the extent of self-sufficiency of households with respect to food. While Guatemala is a largely agricultural country, there is extensive specialization in agriculture on a regional basis and with respect to communities lying at different altitudes within a region. This means that most households are dependent on the well developed agricultural marketing system which has existed in the country for many centuries.

Table 6-7 shows the results obtained from a question which asked household heads what proportion of the food they consume is self-produced. This table reveals the extensive dependence of households, even in more rural areas outside Guatemala City, on the market. In the earthquake area (Experimental group) slightly over 75 percent of the families produced less than 25 percent of their own food and 97 percent reported producing half or less. Only 3.7 percent reported producing most (75%) or all of their food.

A detailed inventory was made of agricultural production and the sale of agricultural products. On the basis of this inventory it was possible to determine how many households produced and sold as much as \$50 worth of agricultural products during the 1975 agricultural year, the one immediately preceding the earthquake. The results of this tabulation are shown in Table 6-8. In the experimental group only 14 percent of the households sold as much as \$50 worth of Agricultural products of all kinds. The remainder either sold none or less than \$50 worth. In the control group slightly more than 9 percent sold over \$50 worth. In the city of course the percentage is less than one percent.

TABLE 6-7

Proportion of Food Produced by Household for Home Consumption,
Classified by Control, Experimental Group and City

Proportion of Food Consumed Produced by Household	Sample Groups							
	Control		Experimental		City		Total	
	#	%	#	%	#	%	#	%
None	288	50.3	341	42.3	313	97.8	942	55.5
Some - 25%	116	20.2	267	33.2	6	1.9	389	22.9
Half - 50%	154	26.9	166	20.7	0	0.0	320	18.9
Almost All - 75%	13	2.2	28	3.5	0	0.0	41	2.4
All - 100%	2	0.4	1	0.1	0	0.0	3	0.2
No Information	0	0.0	1	0.1	1	0.3	2	0.1
TOTAL	573	100.0	804	100.0	320	100.0	1696	100.0

TABLE 6-8

Production and Sale of More than \$50 Worth of Agricultural Products
in 1975 by Households in Control-Experimental Group and City

More than \$50 Income from Sale of Agricultural Products 1975	Control		Experimental		City		Total	
	#	%	#	%	#	%	#	%
No	518	90.4	691	86.0	317	99.1	1527	90.0
Yes	55	9.6	112	14.0	3	0.9	170	10.0
TOTAL	573	100.0	803	100.0	320	100.0	1697	100.0

These figures show clearly that the majority of people in Guatemala, even in largely agricultural regions, are dependent on the market for a substantial part of their food supply. As a consequence, a disruption of marketing activities such as occurred for a period following the earthquake would cause food shortages. Furthermore, the lack of food storage facilities in the home coupled with the practice of buying small quantities of food on an almost daily basis also means that at least temporary shortages would develop almost immediately if marketing facilities and procedures were disrupted.

There is still another perspective pointed to by the above facts. Dependency on the market means that money is needed for the assurance of a food supply. In a massive disaster such as the '76 earthquake, money is also needed to replace housing, household goods and for many other purposes not planned for. This means that there is an acute shortage of monetary resources, given the demand for money. The need for food therefore competes more than ever with other potential uses of scarce monetary resources. As a consequence, the receipt of food relief may free monetary resources for other uses. If, however, relief food drives prices down, those individuals with food to sell will be negatively affected. Table 6-8, however, shows that for 90 percent of the population, the monetary effect could only be a few dollars since this many people sell less than \$50 worth of agricultural products a year. Assuming prices dropped 20 percent, the loss would be less than \$10.00 per household per year. If food donations equaled this amount, the effect would be cancelled, although economic resources would be shifted from one household to another in the process.

Sources of Food

Since it was apparent that most families were not self-sufficient with respect to food, household heads were asked where they obtained their food during the first few weeks following the earthquake. The results shown in Table 6-9 were obtained from this question. It can be seen that more people in the experimental group reported receiving food from an agency (62%) than in the control group (3%) and from relatives or friends (15 percent as compared to 8 percent). More people also reported obtaining food from household storage and by purchase in Guatemala City or another town than their own in the experimental than in the control group.

In contrast, more members of the control group reported buying food at a store or in the market located in their own towns than in the experimental group. The city presents an entirely different picture. There, higher proportions depended on relatives and friends than in the other areas and fewer on food stored in the home. As would be expected, most bought food from stores in the city or obtained it from relief agencies.

Taken as a whole, Table 6-9 shows evidence of disruption of the food distribution system following the earthquake. In general, it would be expected that about the same proportion of people in the control and experimental groups would have obtained food from stores in town or bought food from friends or relatives. The fact that so many fewer in the experimental group bought in stores and markets and more bought from friends or relatives points to a disruption of the normal marketing procedure in the experimental group. This is more than balanced by the distribution of food by agencies who operated as a substitute distribution system.

TABLE 6-9

Sources of Food Following the Earthquake
Classified by Experimental, Control Group and City

Source from which Food was Obtained	Experimental Group		Control Group		City		Total	
	#	%	#	%	#	%	#	%
Undamaged Household Storage	200	25.3	114	21.1	32	10.1	346	21.0
Damaged Household Storage	21	2.7	0	0.0	0	0.0	21	1.3
Bought from or Given by Relatives or Friends	116	14.7	41	7.6	69	21.7	226	13.7
Bought from Store or Market in Town	365	46.3	412	76.3	**	**	777	46.5
Bought from Store or Market in Another Town	67	8.5	63	11.7	10	3.1	140	8.5
Bought in Guatemala City	74	9.4	7	1.3	223	70.2	304	18.4
Donated by Relief Agency from Outside Town	488	61.9	15	2.8	185	58.2	688	41.7
Total Responses	1331	-	652	-	519	-	2502	-
No. of Respondents	789	100.0	540	100.0	318	100.0	1650 *	100.0
AVERAGE NO. SOURCES	1.7	-	1.2	-	1.6	-	1.5	-

*47 missing cases (did not answer this question). 33 in Control, 13 in Experimental and 1 in City.

** "Bought in Guatemala City" is the same as this category for the city.

Another point which leads to the same conclusion involves the number of sources for food in the various groups. More different sources were used by the average person in the experimental group and city (1.7 and 1.6) than in the control group (1.2). This also points to a distribution disruption since several sources of food supply were necessary to many individuals in order to supply their food needs in areas which were hit by the earthquake.

Personal storage represented a minor source of food compared to commercial channels or to agency donations. Only 25 percent of the respondents in the experimental group reported drawing upon their own undamaged stored food supply and about three percent on damaged storage. This is only slightly higher than in the control group, 21 percent of whom reported the same food source.

These facts coincide with earlier figures presented on food production and on self-sufficiency. It is probably true that in the sample as a whole only about a fourth of the people actually had a supply of self-produced food on hand in storage in these areas. In the Highlands 28 percent reported such storage as compared to 16 percent in the East (Table 6-10). Storage was undoubtedly greater in aldeas and smaller more rural municipios than in the department capitols and Guatemala City where only ten percent depended on this source.

The most remarkable figures shown in Table 6-9 are related to food received from relief agencies. In the earthquake affected area (experimental group) nearly 62 percent reported receiving agency donated food. In the City the figure is 58 percent, but in the control group, on the fringes of the earthquake area, only about three percent reported receiving agency

TABLE 6-10
Sources from Which Food was Obtained,

Classified by Region
(Both Control and Experimental included)

Source from which Food was Obtained	East		Highlands		City		Total	
	#	%	#	%	#	%	#	%
Undamaged Household Storage	84	16.2	230	28.4	32	10.1	346	21.0
Damaged Household Storage	1	0.2	20	2.5	-	-	21	1.3
Bought from or Given by Relatives or Friends	62	11.9	95	11.7	69	21.7	226	13.7
Bought from Store or Market in Same Town	321	61.7	456	56.3	219	68.9	996	60.4
Bought from Store or Market in Another Town	53	10.2	76	9.4	10	3.1	139	8.4
Bought in Guatemala City	20	3.9	61	7.5	4	1.3	85	5.2
Donated by Relief Agency from Outside Town	194	37.4	309	38.1	185	58.2	688	41.7
Total Cases	520	100.0	810	100.0	319	100.0	1649	100.0

food. These data were obtained from a question which asked, "Where did you obtain food right after the earthquake?" The respondent was allowed to give his own answer to this question and was not specifically asked about agency food. This means that the 62 percent in the experimental group who mentioned agency food gave this response without prompting. Later a direct question was asked about agency food: "Did you receive any food from an agency?" The results of this question are analyzed in the next section. However, it should be noted that in the experimental group 72 percent reported eventually receiving agency food. (See Table 6-11). In this question no qualification is put on the time when food was received. It could have been months after the earthquake.

TABLE 6-11

Number and Percentage of Families Receiving Food from
Agencies in the Control, Experimental Group and City

Received Food from Agency	<u>Control Group</u>		<u>Experimental Group</u>		<u>City</u>		<u>Total</u>	
	#	%	#	%	#	%	#	%
No	538	94.3	225	28.1	121	37.8	882	52.1
Yes	33	5.7	577	71.9	199	62.2	811	47.9
TOTAL	571	100.0	802	100.0	320	100.0	1693	100.0

These data indicate the level of saturation achieved in food distribution programs in the earthquake area. The saturation is very high, considering the fact that some of the families in the area suffered relatively low damage in the earthquake. They show also that food programs had relatively little spillover into the control group area on the fringe of the earthquake zone and that the distribution programs were heaviest outside Guatemala City. In the next section the question of whether food distribution matched need will be considered by examining carefully the

experimental group sample.

Shortages and the Distribution of Specific Foods

Household heads who reported a food shortage were asked what particular foods were in short supply in their own households. A respondent could give as many as six different answers to this question by naming specific foods they lacked. Following this question, another was asked concerning particular foods the household received as emergency relief from an agency. Again, up to six different foods could be mentioned. Both of these questions required respondents to name foods either in short supply or received from an agency without prompting by the interviewer.

Table 6-12 shows the number of respondents who mentioned various numbers of foods in response to these questions. First, 673 respondents (or 39.7 percent) reported there was no food shortage, and therefore reported no particular foods being short. Similarly, 885 respondents (or 52.2 percent) said they did not receive any food from an agency. Next, it can be seen that only 65 (or 3.8 percent) reported six different foods as being in short supply in their households. This means that 96.2 percent could report all shortages by using only five answers. It is apparent therefore that answers to this question come close to exhausting the possibilities of answers from respondents. Had they been allowed to give as many as ten or fifteen answers, it is unlikely that many would have done so. Answers to this question can therefore be regarded as giving a fairly complete picture of what foods respondents remembered as being in short supply after the earthquake.

With respect to the question concerning foods received from agencies, the situation is somewhat less favorable. Here 183 respondents (or

Table 6-12

Distribution of Responses to Questions Asking About Specific Foods in Short Supply and Received from an Agency
for the Control, Experimental Group and City

Number of Foods Named	Total		Experimental Group				Control Group				City					
	Reports of Food Shortage		Reports of Receiving Food		Reports of Food Shortage		Reports of Receiving Food		Reports of Food Shortage		Reports of Receiving Food		Reports of Food Shortage		Reports of Receiving Food	
	No.	%	No.	%												
0 (no short- age or no food received)	673	39.7	885	52.2	176	21.9	224	27.9	424	74.0	540	94.3	73	22.8	121	37.8
1	46	2.7	26	1.5	34	4.2	14	1.7	4	0.7	5	0.9	8	2.5	7	2.2
2	166	9.8	89	5.2	91	11.3	68	8.5	33	5.8	2	0.3	42	13.1	19	5.9
3	300	17.7	177	10.4	177	22.0	130	16.2	53	9.2	7	1.2	70	21.9	40	12.5
4	287	16.9	184	10.8	173	21.5	119	14.8	40	7.0	12	2.1	74	23.1	53	16.6
5	160	9.4	153	9.0	106	13.2	115	14.3	16	2.8	6	1.0	38	11.9	32	10.0
6	65	3.8	183	10.8	47	5.8	134	16.7	3	0.5	1	0.2	15	4.7	48	15.0
Base of Percent	1697	100.0	1697	100.0	804	100.0	804	100.0	573	100.0	573	100.0	320	100.0	320	100.0

10.8 percent) reported as many as six different foods. Had more answers been allowed, it is probable that some would have named additional foods. For 89.2 percent of the respondents, however, this question represents their memory of what foods they received from an agency.

If only those reporting food shortages are considered as a basis for computing percentages, then 79.3 percent reported shortages of three or more foods, and 85.8 percent reported receiving three or more foods from an agency. These figures seem to indicate substantial shortages of particular foods, especially when it is considered that very few respondents reported only one food in either case.

Table 6-12 gives a comparison of the control, experimental group and city on these two questions. It can be seen that in the experimental group 62.0 percent of the 804 respondents named three or more foods they lacked as compared to 19.5 percent in the control group. In the city the comparable figure was 61.6 percent. Furthermore, 19.0 percent of all respondents in the experimental group and 16.6 percent in the city named five or more foods as being in short supply. This compares to only 3.3 percent in the control group. These figures support the conclusion that there was a relatively severe food shortage in the earthquake damaged areas following the disaster, since only on this assumption can the experimental, city and control differences be reasonably explained.

Similar contrasts between sub-samples are obtained when figures on foods received from agencies are examined. In the experimental group 62.0 percent of the respondents reported receiving three or more different foods from an agency. In the city the comparable figure is 54.1 percent, but in the control group only 4.5 percent of the respondents received three or more foods. More dramatically, nearly 17 percent in the experimental

group and 15 percent in the city received six or more different types of food, while only one person (0.2 percent) in the control group made a similar report. These figures indicate that food distribution programs were highly concentrated in the disaster area with relatively little spillover outside it.

Table 6-13 presents the results of these two questions for persons living in the damaged area only and shows the specific foods mentioned. In other words, the control group is excluded from this table and figures are given for the experimental group and city sample only. These groups are broken down by regions of the country.

When the totals for all regions are examined it is seen that the most frequently mentioned shortages, in order of the percentage of respondents mentioning them, were: black beans 52.1 percent, corn 47.2 percent, sugar 42.5 percent, noodles or bread 28.2 percent, rice 27.8 percent, and coffee 19.4 percent. No other food was mentioned by as many as 20 percent of the respondents. There are differences between geographic areas observable in this table. For example, the shortage of corn was far less severe in the Highlands (36.0 percent) as compared to the East (53.6 percent) and the City (59.4 percent). This reflects the difference in production of these products in these areas. A similar variability exists for black beans: Highlands 45.2 percent, East 60.8 percent, and City 55.3 percent.

Careful examination of this table will reveal that the shortage of basic foods such as corn, beans, sugar, lard or oil, and coffee were generally reported by fewer people in the Highlands than in the East or City samples. Again, this problem reflects differences in agricultural

Table 6-13

Number and Percentage of Respondents Reporting Shortages and Reporting Receiving Various Foods from an Agency

Food Product	East		Highlands				City				Total					
	Short		Received		Short		Received		Short		Received		Short		Received	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Corn	157	53.6	158	53.9	184	36.0	146	28.6	190	59.4	113	35.3	531	47.2	417	37.1
Black Beans	178	60.8	203	69.3	231	45.2	230	45.0	177	55.3	167	52.2	586	52.1	600	53.4
Sugar	119	40.6	66	22.5	234	45.8	146	28.6	125	39.1	59	18.4	478	42.5	271	24.1
Lard/Oil	25	8.5	25	8.5	14	2.7	54	10.6	12	3.8	17	5.3	51	4.5	96	8.5
Coffee	80	27.3	29	9.9	106	20.7	41	8.0	32	10.0	13	4.1	218	19.4	83	7.4
Salt	34	11.6	25	8.5	84	16.4	52	10.2	10	3.1	10	3.1	120	10.7	87	7.7
Vegetables(chile, onions,garlic)	4	1.4	2	0.7	38	7.4	1	0.2	1	0.3	0	0.0	43	3.8	3	0.3
Gruel	7	2.4	17	5.8	0	0.0	2	0.4	1	0.3	4	1.3	8	0.7	23	2.0
Rice	103	35.2	154	52.6	134	26.2	190	37.2	76	23.8	115	35.9	313	27.8	459	40.8
Meat	17	5.8	9	3.1	112	21.9	15	2.9	41	12.8	28	8.8	170	15.1	52	4.6
Milk	26	8.9	61	20.8	40	7.8	76	14.9	51	15.9	54	16.9	117	10.4	191	17.0
Eggs	14	4.8	5	1.7	18	3.5	5	1.0	11	3.4	7	2.2	43	3.8	17	1.5
Juice,Soft Drink	0	0.0	25	8.5	1	0.2	20	3.9	0	0.0	9	2.8	1	0.1	54	4.8
Millet, Wheat	0	0.0	5	1.7	2	0.4	10	2.0	0	0.0	1	0.3	2	0.2	16	1.4
Other Vegetables	2	0.7	6	2.0	41	8.0	17	3.3	11	3.4	8	2.5	54	4.8	31	2.8
Fruit	3	1.0	15	5.1	5	1.0	18	3.5	2	0.6	11	3.4	10	0.9	44	3.9
Flour,Incaparina	7	2.4	52	17.7	39	7.6	140	27.4	8	2.5	62	19.4	54	4.8	254	22.6
Noodles,Bread	54	18.4	35	11.9	133	26.0	86	16.8	130	40.6	50	15.6	317	28.2	171	15.2
Beans (non-black)	0	0.0	10	3.4	0	0.0	19	3.7	0	0.0	8	2.5	0	0.0	37	3.3
Canned Meat	1	0.3	75	25.6	0	0.0	81	15.9	0	0.0	53	16.6	1	0.1	209	18.6
Canned Veg.or Fruit	0	0.0	21	7.2	0	0.0	25	4.9	0	0.0	23	7.2	0	0.0	69	6.1
Fruit Preserves	1	0.3	4	1.4	0	0.0	1	0.2	0	0.0	7	2.2	1	0.1	12	1.1
Seasonings	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Canned Sauces	0	0.0	3	1.0	0	0.0	1	0.2	0	0.0	0	0.0	0	0.0	4	0.4
Dried Soup	0	0.0	1	0.3	0	0.0	1	0.2	0	0.0	0	0.0	0	0.0	2	0.2
Other	0	0.0	6	2.0	0	0.0	6	1.2	0	0.0	4	1.3	0	0.0	16	1.4
Base of Percentage 293 (No.of Respondents)			293	-	511	-	511	-	320	-	320	-	1124	-	1124	-

production in these areas. In general, the City and East samples show about the same pattern of shortages.

One use of this table is to confirm the reports of food shortages reported in the general question discussed earlier which merely asked whether there "was a food shortage in this house?" These data show that respondents who answered yes to this question could and did name particular shortages that conform closely to the dietary patterns and agricultural production patterns of the country. It further shows that there was a shortage, of undetermined magnitude, of the two basic foods in the Guatemalan diet, corn and beans. These shortages were reported despite the fact that these are also the two most commonly grown agricultural products.

The figures on food distribution shown in Table 6-13 correspond rather closely to those on food shortage. The most commonly received food products were: black beans,* 53.4 percent, rice 40.8 percent, corn 37.1 percent, sugar 24.1 percent, flour, soy, wheat, Incaparina 22.6 percent. More people reported receiving beans, rice and flour than reported shortages of these products, but fewer people received corn and sugar than reported shortages.

The list of foods received shows that many foods relatively rare in the diets of average Guatemalans outside the city were distributed. For example, 18.6 percent report receiving canned meat, and 6.1 percent canned vegetables or fruits. These products were not part of the food relief provided by Public Law-480 but distributed by agencies who collected food from private donors to be delivered in Guatemala. Much of this more exotic food was not used by people in the countryside because of its

*Actually most beans distributed in Guatemala as food relief were other kinds of beans, pinto, for example.

unfamiliar nature, according to many observers who were on the scene at the time.

There are certain cautions that should be exercised in interpreting this material. While it appears that the distribution of particular products came fairly close to corresponding to needs, especially where primary food products are concerned, there is no information in this table on whether it corresponded (a) to the person who needed it and (b) whether it was received on time to relieve the shortage or after the shortage had subsided for other reasons. There is information available to examine the first question but none to settle the second.

One way of examining a food distribution program is to look at it in terms of whether the people reporting a particular kind of food shortage, say a shortage of corn, received that product as food relief. It is possible to define success and failure in food distribution using the following type of table.

TABLE 6-14

Definition of Success and Failure in Food Distribution

Food Shortage	<u>Received Food to Alleviate Shortage</u>	
	No	Yes
No	Type I Success	Type I Failure
Yes	Type II Failure	Type II Success

If a person is not short of a particular food, corn for example, and does not receive corn, this is counted as a Type I success. If a person is short of corn and receives it, this is an example of a Type II success.

In contrast, if a person is not short of corn and does receive it, this is a Type I failure, and finally, if a person is short of corn but does not receive it, this is a Type II failure. Thus Total Successes = Type I + Type II, and Total Failure = Type I + Type II.

Appropriateness of Food Distribution

As noted above, one way to measure the appropriateness of food distribution programs is to compare those who reported shortages and those who did not in terms of whether or not they received food during the emergency food distribution. In this study the best sample to use for this purpose is the experimental group since it is within this group that the food shortage produced by the earthquake should have existed and it was within this area that food distributions were carried on. A similar condition existed in the city but the sample is such that it can reveal little of general value to measuring the appropriateness of distribution.

Table 6-15 shows figures for those who reported food shortages cross classified by whether they received food from an agency or not. This table can be used to compare successes and failures in the food distribution program at the gross level. There are two kinds of successes shown in the table. The most important (Type II) is shown in the lower right hand cell representing people who had a shortage and received food. The second is in the upper left hand cell (Type I) where people are shown who did not have a shortage and did not receive food. Similarly there are two types of failures. The most serious is shown in the lower left hand cell (Type II Failure) where people reported shortage and did not receive food. The other is in the upper right where people who did not have a shortage received food nevertheless (Type I Failure). It is this cell

TABLE 6-15
Experimental Group Households Reporting Food Shortages Classified
by Whether They Received Food or Not

Food Shortage	Received Food from Agency				TOTAL	
	No		Yes		No.	%
	No.	%	No.	%		
	Success		Failure			
No	81	10.1	93	11.6	174	21.7
	Failure		Success			
Yes	143	17.8	485	60.5	628	78.3
TOTAL	224	27.9	578	72.1	802	100.0

of the table that food program critics were most concerned about.

There are many ways to read and interpret this simple table in terms of its meaning for food program success or failure. One is in terms of success rate or its opposite failure rate. It can be seen that 70.6% of the cases represent success in that food distribution matched reported need.

Of this 70.6%, most cases (60.5%) are of the most important type, giving food to people reporting need, and only 10.1% not giving food to people who didn't need it. On the failure side, most failures fall in the cell which represents the most important type of failure from the perspective of wanting to get food to those in need. Approximately 17.8% of the cases are cases where people said they needed food and did not receive any. This

leaves only 11.6% of the cases representing people who did not need food but nevertheless received it. In other words, measured in terms of numbers of households with shortages, under-distribution outweighs over-distribution.

It must be remembered that this table does not show the amount of shortage in terms of the volume or types of food needed, but only in terms of the numbers of households reporting shortages and the numbers receiving food. Individual households could have received more or less food than was needed and this table would not show it. Furthermore, they could have received the food after the worse part of the shortage was over rather than when it was most needed and it would not show in this table. One defect in the data is that we do not know when the food was actually delivered to individual households.

There is a way, however, to examine the question of whether specific shortages were matched by specific food distribution. We can tell from other data, for example, whether a household was short of corn, and whether it received corn. These data are given in Table 6-16.

This table is arranged so that foods are listed in order according to the percentage of respondents reporting a shortage of that particular product. (This percentage is shown in Column 1.) In the left hand half of the table are shown cases in which people did not report a shortage of the various foods. On the right are those who did report shortages. Each half of the table is broken down by whether they received that particular food from an agency or not. The table therefore can be used to examine the matching of particular food needs against particular food distributions for the ten basic foods comprising the bulk of the average Guatemalan's diet.

Success and failure in the distribution program can be examined

Table 6-16

Success and Failure in the Distribution of Ten Basic Foods: Food Need Cross Classified by Food Receipt

Food Product	Percent Reporting Shortage	Did Not Lack Food Product in Household						Lacked Food Product in Household						Success Rate
		Success		Failure		Total		Failure		Success		Total		
		Did Not Receive Food Product		Received Food Product				Did Not Receive Food Product		Received Food Product				
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Beans	50.9	223	56.5	172	43.5	395	100.0	148	36.2	261	63.8	409	100.0	60.2
Sugar	43.9	347	76.9	104	23.1	451	100.0	246	69.7	107	30.3	353	100.0	56.5
Corn	42.4	327	70.6	136	29.4	463	100.0	173	50.7	168	49.3	341	100.0	61.6
Rice	29.5	360	63.5	207	36.5	567	100.0	101	42.6	136	57.4	237	100.0	61.7
Coffee	23.0	573	92.6	46	7.4	619	100.0	161	87.0	24	13.0	185	100.0	74.2
Meat	16.0	655	97.0	20	3.0	675	100.0	125	96.9	4	3.1	129	100.0	82.0
Salt	14.7	631	92.0	55	8.0	686	100.0	96	81.4	22	18.6	118	100.0	81.3
Vegetables	6.5	759	99.6	3	0.4	762	100.0	42	100.0	0	0.0	42	100.0	94.4
Flour	5.7	592	78.1	166	21.9	758	100.0	20	43.5	26	56.5	46	100.0	76.9
Lard/Oil	4.9	700	91.5	65	8.5	765	100.0	25	64.1	14	35.9	39	100.0	88.8
TOTAL	23.6	5167	84.1	974	15.9	6141	100.0	1137	59.9	762	40.1	1899	100.0	73.7

separately for those lacking particular foods and for those not lacking them. For example, with respect to beans, 395 people out of 804 reported no shortage of beans. Nevertheless 172, or 43.5 percent, of them received beans from an agency. This represents a success rate of 56.5 percent achieved by not giving beans to people who didn't need them. On the other hand 409 households reported a shortage of beans and 261 received them, representing a success rate of 63.8 percent with respect to bean distribution.

When the two types of success are added together with respect to beans, not giving them to people who did not need them, and giving them to people who did need them, the success rate for beans shown in the last column of the table is obtained (60.2 percent). Similar figures are offered for each of the ten basic foods.

When the success rates in the final column are examined it will be seen that success rates are highest with respect to those foods which occur at the bottom of the table. Those foods at the bottom are those where there was not a very great shortage. Take the example of vegetables (Chili, onions, tomatoes and garlic). Only 6.5 percent of the respondents reported a shortage of these items. Also only three people reported receiving them. Therefore by not giving people vegetables the agencies achieved a 94 percent success rate on this food product. In contrast, beans were reported as being in short supply or lacking in their households by 50.9 percent of the respondents in the experimental group. Here, however, only a 60.2 percent success rate was reported. In general, the largest number of successes are a result of not giving food to people who didn't need it rather than by giving food to people in need.

This can be most clearly seen by examining the bottom row in the table showing the totals for all foods taken together. There are 5167 instances

of not giving food to people who didn't need it and only 762 instances of giving food to people in need. Taken together, this results in a 73.7 percent success rate. Only 9.5 percent of this success rate represents positive successes and the remaining 64.2 percent represent negative successes.

On the failure side more failures (1137 cases) represent not giving food to people in need than giving people food who didn't need it (974 cases). In other words, of the 26.3 percent failures 14.1 percent are of the positive sort and 12.2 percent of the negative sort.

What interpretation can be given to these results as far as their meaning in terms of the criticisms made of food programs is concerned? First, it is apparent that agencies did not, for the most part, indiscriminantly give food to people who did not need it. Most of the cases in the above table represent non-distribution to people not in need. Only a relatively few cases exist in which people not needing food received it (12.1 percent).

On the other hand, of the people in need, only 40.1 percent received the kind of food they needed and 59.9 percent did not. This seems to indicate that food programs, while not giving food to people not in need, also missed giving food to a great many who needed it. The success rate of 73.7 percent is a result primarily of leaving out those not in need of food instead of getting food distributed to people in need. Furthermore, it appears that the 974 mistakes made of the negative sort representing over-distribution come very close to balancing those of a positive sort (1137 cases) indicating that about the right number of families received emergency food but that the distribution left something to be desired.

Table 6-16 includes the ten basic food products consumed by the average Guatemalan and the totals shown at the bottom of this table show the number

of cases in which the two types of success and failure were reported. A case amounts to a respondent reporting a particular food shortage, and either reporting or not reporting receiving that food. Since a respondent may have reported several shortages he will appear several times in the total. In all, each respondent will show up ten different times in this tabulation since he will be recorded as giving an answer on each food product. Given any particular food product, the frequencies represent the number of households falling into that category. For the totals at the bottom of the table, however, this is not the case. These totals represent the number of instances in which a shortage or non-shortage, distribution or non-distribution, took place.

Since corn and beans are the basis of the average Guatemalan diet, it will be instructive to look at success and failure rates using these two products combined. When this is done the following four celled table is obtained.

TABLE 6-17

Success and Failure of the Distribution of Beans and Corn

Shortage of Corn and/or Beans	Received Corn and/or Beans					
	No		Yes		Total	
	No.	%	No.	%	No.	%
	Successes			Failures		
No	550	34.2	321	20.0	871	54.2
	Failures			Successes		
Yes	308	19.1	429	26.7	737	45.8
TOTAL	858	53.3	750	46.7	1608	100.0

Successes = 34.2 + 26.7 = 60.9, Failures = 19.1 + 20.0 = 39.1

It can be seen that the success rate considering only corn and beans is 60.9 percent as compared to the rate obtained from considering all ten food products (73.7). This lower success rate, however, is due to the fact that many more people reported a shortage of these products than of other products on the list of ten. As a consequence, fewer successes of the negative sort, not giving these products to people not needing them, were recorded. When only people needing corn and beans are considered, 429 cases out of 737 represent successes, or 58.2 percent. This contrasts with 762 cases out of 1899 for all ten foods taken together, or 40.1 percent success. In other words, proportionately more people needing corn and beans received them than received the other products. This is offset by the fact that proportionately more people not needing these products also received them (36.9%) than in the case of the ten food products taken together (15.9%). It appears therefore that in order to increase the success rate of getting a given product to people in need it was necessary to increase the risk of giving food to people who did not need it.

This is a reasonable outcome, given the conditions prevailing after a disaster. In order to avoid giving food to people who do not need it and at the same time to give it only to people in need, it would be necessary to engage in social case work screening activities to determine need. Such activities require setting up a bureaucracy and conducting field investigations as a basis for distributing aid. This would result in delays in delivery under conditions where immediate delivery is regarded as critical. The alternative is to use crude assessments of need and to risk over-distribution in order to insure a greater success rate. The solution most often used in Guatemala was to employ local committees or local leaders or officials believed to be familiar with the situations in individual households.

Such a system risks a certain amount of maldistribution since it is open to local politics and to the desire of local leaders to avoid criticisms for inequity.

The figures given in Table 6-16 match particular food needs with particular food distributions. The interpretation of success and failure obtained from this table is rather strict in that a success is defined as giving the exact food which was said to be in short supply, or refraining from giving a particular food to a household that did not lack that food. This method tends to accentuate failures in food distribution since it does not allow the substitution of one food for another. For example, if a family reported being short of corn and was given rice instead, this is counted as a failure. In terms of meeting the temporary need for calories during an emergency, however, it could be counted as a success. Given this fact, these data seem to give strong support to the conclusion that food distribution programs did not indiscriminately distribute food regardless of need. Unfortunately, however, these data do not measure the quantity of food distributed in relation to the amount of maldistribution.

Political Status and the Success of Food Distribution Programs

The sample for this study included communities varying in size, isolation and political status. Political status refers to the community's location in the centralized administrative system of the country. There are four types of units considered in this research: City neighborhoods, Department Capitols, Municipios and Aldeas. In Guatemala a department capitol is comparable to a state capitol in the United States and a municipio to a county seat, while an aldea is usually a rural small town or village. Thus political status roughly corresponds both to the size

of a place and its relative degree of isolation from the administrative center.

It will be useful to examine success rates in the emergency food distribution in different types of places. Table 6-18 gives data showing the number of households that reported or did not report general food shortages, cross classified by whether they received food from an agency.

This table shows clearly that the smaller and more remote the place, the higher the general success rate in distributing food. Not only is this true of the total success rate, but the successes in getting food to people in need, in contrast to not giving food to people not needing it increases as the community becomes smaller and more isolated. Positive successes go from 49.7 percent in the city up to 69.3 percent in aldeas. Furthermore, failures to get food to people in need decreases as the place gets smaller (27.5% in the city as opposed to 7.4% in aldeas).

This finding is particularly important since many people believed that the opposite took place. That is, that the larger places, close to the main highway and to Guatemala City got most of the aid. Actually, with respect to food, the opposite is the case. This represents an unusually significant finding with respect to evaluating agency programs since it appears that they succeeded in overcoming the factors associated with isolation in conducting the distribution.

There is one negative note of caution that needs to be stated along with this finding. In general, the smaller the place, the more agricultural the population, and therefore under normal circumstances, the more likely food would be available. If we take at face value reports of shortage in individual households, then we still must ask whether others in the community had food to sell and could not sell it because of competition from free

Table 6-18

Success and Failure in Emergency Food Distribution in Different Size Communities in the
Experimental Group (Food Shortage Cross Classified by Food Distribution and Political
Status of Communities)

	<u>No Food Shortage Reported</u>				<u>Reported Food Shortage</u>				<u>Success Rate</u>	<u>Total Cases</u>
	<u>(Success)</u>		<u>(Failure)</u>		<u>(Failure)</u>		<u>(Success)</u>			
	<u>Did Not Receive Food</u>		<u>Received Food</u>		<u>Did Not Receive Food</u>		<u>Received Food</u>			
	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>		
City	33	10.3	40	12.5	88	27.5	159	49.7	60.0	320
Departmental Capitols	25	11.3	24	10.8	54	24.3	119	53.6	64.9	222
Municipios	45	11.1	39	9.6	76	18.8	244	60.4	71.5	404
Aldeas	11	6.2	30	17.0	13	7.4	122	49.3	75.6	176
TOTAL	114	10.2	133	11.9	231	20.6	644	57.4	67.6	1,122

food. Furthermore, these figures do not measure either the quantity of food needed or the quantity distributed. It is possible that too much food or too little food was distributed in individual cases.

Chapter 7

The Impact of Emergency Food on Food Prices and Production

Charles D. Killian, Frederick L. Bates

and

Robert E. Klein

Perceptions of the Impact of Food Distribution Programs

One criticism of emergency food programs following the earthquake was that so much food was distributed that food prices decreased, thus penalizing farmers and food merchants with food to sell. It was believed by critics that an ample supply of food was on hand and that massive distributions of free food could only have a negative impact on the market. By lowering the income of farmers and others dealing in foods, they were denied money needed for reconstruction of their houses and the replacement of their household goods. Of special interest was the importation of basic grains since these were in direct competition with Guatemalan products.

The question of price impact is a complex one to deal with and requires a rather careful analysis. There are a number of complicated theoretical issues involved. These will be dealt with first to set the stage for later data analysis.

Prices in a free market situation are determined by the relationship between supply and demand. The argument for a price impact of massive free food distribution is that such distributions offer an increased supply of food at zero price and thereby siphon off demand, leaving the remaining supply of food saleable only at a lower price than would have been the case with no competition from free food distribution. In other words, it is by satisfying demand without cost, thus lowering the aggregate demand for the products left over after free food distribution, that the price

impact takes place.

Demand in reasoning related to the determination of prices refers to people who have money to spend on a product at a given price. Those who have no money to spend at any price are simply not in the market and, as a consequence, can have no impact on prices. The penniless may want and need food but in an economic sense they are not a part of the "demand" for it.

If free food were distributed only to people who had no money and were therefore not in the market, it could not have any price impact since it would not have any impact on satisfying demand. True, it would satisfy wants, or needs, but it would not satisfy demand in the economic sense. The question of price impact from emergency food boils down in one sense to a question of whether the disaster impacted population had the money to spend for food, and whether a supply of food was available to satisfy that demand in a functioning market at a price that would allow people to function as they normally did in the market. If the foods distributed would otherwise have been bought, then a price impact is expected.

That impact could have one of two effects. First, it could lower prices in an absolute sense so that they would be lower after the earthquake than before. This would cut into the normal incomes of farmers and have a negative effect on the agricultural economy although it would benefit those receiving food to the extent that they would have lower food bills. A second possible effect would be to mitigate price increases caused by the earthquake's effect on supply. If the supply of food were reduced by the earthquake and demand remained high, a price increase would be expected. Free food distribution, if it only replaced losses, would prevent a price increase. This of course actually amounts to lowering

prices below what they would have been if no free food were distributed. Windfall profits would be lost and this would affect farmers' and food merchants' incomes. It would, however, have a positive effect on consumers by preventing increases in food bills.

Whether the impact would be large or small is a question of how much of the product is introduced into the market at zero price in relation to the amount already available, and traded in the market. If a very small amount of increase in supply occurs as a result of food distribution, and some of this is distributed to people who would not otherwise have bought it, the price impact should be small. It might, however, impact on prices in the market for a short time during which it could supply the demand that would ordinarily be registered as purchases.

After this period was over, prices should return to their previous level and the supply of food offered in the market, along with continuing demand, would determine prices. This is like saying if enough free food were available to meet the demand registered on the market for one day, prices that day would drop to zero and no one would buy food. However, the next day, when no free food is offered, the ordinary price mechanisms would prevail. Long range impact would depend on whether at the end of a crop year supply remained larger than usual to the extent that it affects supply-demand relationships and results in a lower than expected price.

It is impossible to tell how many of the people receiving free food were without funds to buy it and therefore to assess the true increase supply, or reduction in demand caused by it. It is possible, however, to relate the amount of food distributed as disaster aid to the annual production of that product and thereby to assess the probability of a

large or small price impact. This will be done after we examine the perception of people with respect to what happened to prices following the earthquake.

Perception of Food Price Impact of the Disaster and Relief Effort

During the course of the first interview, which took place approximately two years after the earthquake, household heads were asked what happened to food prices in their particular towns following the earthquake. This question was part of a series which asked about food shortages caused by the earthquake and about emergency food distribution. The context implied that price changes due to the earthquake were the subject of the question but the question was stated simply as, "Do you think food prices in this town changed after the earthquake?"

Table 7-1 gives a summary of the answers to this question for the control, experimental group and city samples. Over 82 percent of all respondents said that food prices increased in their particular towns and only about two percent said they decreased. The remaining 12 percent, excluding those who did not answer, said food prices remained the same. It must be remembered that a general inflation in all prices was taking place in Guatemala at the time of the earthquake, and food prices were no exception. It is to be expected, therefore, that most people would notice a price increase and report it in response to this question, even if the earthquake had not occurred. The interesting thing about this table is that fewer people in the experimental group than in the control group reported such increases (76.5% as compared to 88.5%). Furthermore, more people in the experimental group than in the control group reported

TABLE 7-1

Perceptions of Food Price Changes in the Control,
Experimental Group and City

Did Food Prices Change	Control Group		Experimental Group		City		Total	
	#	%	#	%	#	%	#	%
No Change	46	8.0	142	17.7	23	7.2	211	12.4
Decreased	5	0.9	26	3.2	6	1.9	37	2.2
Increased	507	88.5	615	76.5	279	87.2	1401	82.6
No Information	15	2.7	21	2.6	12	3.7	48	2.8
TOTAL	573	100.0	804	100.0	320	100.0	1697	100.0

price decreases (3.2% as compared to 0.9%). When the no information category and the city are eliminated and the control and experimental group are compared using Chi Square, a significant difference is obtained ($\chi^2 = 37.2$ with 2df, Prob. .0001).

This points indirectly to the possibility that food distribution by relief agencies in the experimental group may have mitigated the effects of price increases due to inflation, and to earthquake created shortages, resulting in lower increases, rather than decreases in prices. Of course these data merely examine the number of people reporting increases and decreases and not the actual price changes which occurred or their amount.

A result with a similar possible interpretation is obtained when the regions of the country are considered using only the experimental group. In the East 71.7 percent said food prices increased as compared to 85.1 percent in the Highlands. In contrast, 4.5 percent said prices decreased in the East, and 1.3 percent in the Highlands. The remainder said they

remained the same or gave no information. This result is also statistically significant ($\chi^2 = 39.4$, 2df. Prob. .0001).

Observations concerning food distribution show that more families received free food in the East than in the Highlands (55.4% as compared to 50.2%) and food distributions continued for a longer time. Again it appears possible that food distribution programs may have had more of a moderating effect on price increases in the East than in the Highlands. It appears possible that, rather than lowering prices from pre-earthquake levels, the effect was to lower the rate of increase throughout the impact zone. Whether this is true or not depends upon analysis of actual price data. This will be presented below but before that it will be useful to examine perceptions of the price impact of food programs and of their effects on agricultural production taken from the final interview conducted four years after the earthquake.

In order to clarify perceptions of food program impact obtained in the first interview, a series of questions were introduced into the final one. These questions, among other things, asked whether food programs in general (whether emergency or regular programs) have an impact on food prices. The previously discussed question asked whether food prices changed after the earthquake, and did not inquire into the respondents' beliefs concerning whether food programs were among the causes. The results of the question specifically concerning food program impact on prices are given in Table 7-2.

Not surprisingly, over 91 percent of all respondents said they do not have any effect on food prices. Only two persons said they decrease them, while 3.7 percent said they increase such prices. It is difficult to understand how food programs involving the free distribution of food

TABLE 7-2

Perception of Food Program Impact on Food Prices for
Control, Experimental Group and City

Do Food Programs Affect Prices	<u>Control Group</u>		<u>Experimental Group</u>		<u>City</u>		<u>Total</u>	
	#	%	#	%	#	%	#	%
No	222	93.6	215	88.1	109	93.2	546	91.3
Yes, Increase	2	0.8	15	6.1	5	4.3	22	3.7
Yes, Decrease	2	0.8	0	0.0	0	0.0	2	0.3
No Information	11	4.8	14	5.7	3	2.5	28	4.7
TOTAL*	238	100.0	244	100.0	117	100.0	599	100.0

*Only persons on food programs, or who said they knew about them were asked this question.

products could increase prices. It must be assumed therefore that some respondents misunderstood the question or were reporting what they perceived to be the price trend in their communities.

Similar results were obtained for food program impact on production, with one difference. The vast majority of respondents (90.7%) said food programs do not affect food production but at the same time, 3.4 percent said that they lower production as compared to 1.0 percent who said they raised production. About 5.0 percent of all respondents could give no answer to this question. If these are discounted, then 95 percent of those giving answers to the question said there was no production impact and 4 percent said they lowered production. The remaining one percent said they raised it.

Only persons who actually reported being on PL-480 food programs, or who claimed they knew about them, were asked these questions. It is likely

that they were answering concerning regular food programs rather than the emergency food programs which followed the disaster.

When the same respondents were asked whether they thought food programs are helpful and whether they are fair or just, the answers given in Table 7-3 were obtained. The most interesting finding contained in this table is that 58.3 percent of all respondents had no knowledge of food programs. In other words, well over half of all respondents either did not know that such programs existed, or had so little information about them that they could not answer this question.

Of those who answered, 557 said they helped the families enrolled and 33 said they did not. This means that 94.4 percent of those familiar with food programs regarded them as being helpful.

Those who said they knew about food programs were asked whether they thought they were "fair" or "just." Presumably they answered this question in terms of whether they were managed in an equitable fashion. Table 7-4 gives the results of this question. Of the 600 persons who were asked this question, 47, or 7.8 percent, were unable to give an opinion on this question. Apparently, while they knew something about the programs, they either did not know enough to express an opinion or were reluctant to do so for other reasons. Of those expressing an opinion, 462, or 83.5 percent, said food programs were fair. The remaining 16.5 percent said they were unfair or unjust. While this indicates a relatively high rate of approval for food programs, a substantial number of people are critical. Considering the tendency of subjects to express approval, and reluctance to express disapproval, this is a finding worth further evaluation. For example, are those who say food programs are unjust, people who are not on food programs?

Table 7-3

Distribution of Answers to the Question: Do Food Programs Help?

Do Food Programs Help	Control Group		Experimental Group		City		Total	
	No.	%	No.	%	No.	%	No.	%
No	24	4.8	4	0.6	5	1.9	33	2.3
Yes	207	41.1	238	35.9	112	41.8	557	38.8
Don't Know About Programs	266	52.8	419	63.2	151	56.3	838	58.3
No Info.	7	1.3	2	0.3	0	0.0	9	0.6
TOTAL	504	100.0	663	100.0	268	100.0	1437	100.0

Table 7-4

Distribution of Answers to the Question: Are Food Programs Fair or Just?

Are Food Programs Fair or Just	Control Group		Experimental Group		City		Total	
	No.	%	No.	%	No.	%	No.	%
No	39	16.3	29	11.8	23	19.7	91	15.1
Yes	183	77.1	196	80.0	83	70.9	462	77.1
No Info.	16	6.6	20	8.2	11	9.4	47	7.8
TOTAL	238	100.0	245	100.0	117	100.0	600	100.0

Do they concentrate in one or two villages where programs are badly run or are they scattered over the country?

When only those who say food programs are unjust are examined, 74 out of 91, or 81.6 percent, are people who are not on food programs, and 17, or 18.4 percent, are people who are on food programs. It appears therefore that there is a strong association between being included or excluded from participation in PL-480 programs and approval or disapproval of them. When the data were examined to determine if those who disapprove were concentrated in one or two villages, it was found that nearly two-thirds of all cases saying food programs were unfair came from six communities out of the total of twenty-six. These units include two city neighborhoods, one aldea in the experimental group and two municipios and an aldea in the control group. In 16 villages, three or less people made such a statement.

These results, though statistically small, point to the conclusion that food programs are regarded as fair in most of our sample units. However, in a few of them there appears to be a problem in how food programs are being managed. It should be remembered, however, that these results pertain primarily to regular PL-480 food programs and not to emergency food distribution programs. Since much of the food distributed during the year following the earthquake (about 2/3) was distributed through regular PL-480 food programs, rather than through special emergency distribution systems, these results have indirect significance for this post-disaster food distribution study.

The Amount and Type of Food Distributed in Guatemala After the Earthquake

Various sources disagree on the amount and kinds of food distributed by relief agencies following the 1976 earthquake. For example, Froman, Jackson and Gersony, in their report entitled, "General Review of PL-480 Food Assistance in Guatemala, June 1977," state that 25,400 metric tons of food were distributed during 1976. They claim that this food was broken down into types as follows:

TABLE 7-5

PL-480 Food Distributed in Guatemala During 1976
(Source - Froman, Jackson and Gersony Report)

Basic Grains

Corn (Mostly whole yellow corn, some processed)	25%	6,400 tons
Beans	20%	5,000 tons
Wheat (Bulgur wheat and wheat flour)	20%	5,200 tons
Oats	5%	1,200 tons
TOTAL	70%	17,800 tons

Other Foods

Whey-Soy mix	11%	2,900 tons
Milk-Powder	6%	1,600 tons
Cooking Oil	5%	1,200 tons
Other	8%	1,900 tons
TOTAL	30%	7,600 tons

In contrast, data obtained from the U. S. Embassy in Guatemala City on PL-480 food actually distributed by CARE and Catholic Relief Services to families give the following figures (Table 7-6). As can be seen, there

TABLE 7-6

PL-480 Food Distributed in Guatemala January 1976-December 1976
(Source: U. S. Embassy, Guatemala City 1980)

<u>Basic Grains</u>		
Corn (yellow)	9.2%	1,684 tons
Beans (Pinto)	14.0%	2,551 tons
Wheat (Wheat Flour and Bulgur)	24.5%	4,467 tons
Oats (Rolled)	5.9%	1,086 tons
TOTAL	53.6%	9,788 tons
<u>Other Foods</u>		
Whey Soy	4.0%	738 tons
Powdered Milk	4.3%	778 tons
Cooking Oil	6.3%	1,144 tons
Other (CSM, Sorghum grits, Incaparina, WSB)	31.8%	5,805 tons
TOTAL	46.4%	8,465 tons
GRAND TOTAL	100.00	18,253 tons

are substantial differences between these two tabulations. The most important difference from the perspective of this report lies in the figures given for corn and beans and for the total amount of food distributed. Froman, Jackson and Gersony report that 6,400 tons of corn were distributed, while the U.S. Embassy reported that only 1,684 tons were passed out through CARE and CARITAS. This difference of 4,716 metric tons is extremely large and could account for a difference of opinion as to the potential impact of corn distribution on prices.

The figures on beans show a similar discrepancy, with Froman, Jackson and Gersony reporting that 5,000 tons were distributed, while the U. S.

Embassy reported 2,551 tons, a difference of 2,449 tons. The category "Other Products" also shows a large discrepancy in the opposite direction. Here, the Embassy reported a greater amount (5,805 tons) than Froman, Jackson and Gersony (1,900 tons). The difference of 3,905 tons is in such products as CSM (corn, soy, milk), sorghum grits, WSB(wheat soy blend) and Incaparina.

The difference in figures given for the total amount of food distributed by the two sources is quite large, with Froman, Jackson and Gersony reporting a total of 25,400 metric tons and the U. S. Embassy reporting 18,253, for a difference of 7,147 metric tons. The larger figure is 39% larger than the smaller figure. Most of this difference is due to higher figures for basic grains in the Froman, Jackson and Gersony report where they report a total of 17,800 tons of "basic grains" as opposed to 8,788 reported by the Embassy for a difference of 9,012.

Figures on PL-480 are compiled on various bases and the tabulations using these different bases do not always agree. One way is to report the amount and type of food requested by agencies in their annual budget requests. A second way is to report the actual amounts delivered at the port of delivery. A third way is to report the amount distributed through food programs in a given period of time. This last figure discounts the amount of spoilage and loss between the port and the actual distribution to program families. It also does not include the amount of food actually delivered to the port but held in storage for future delivery to families, or that stockpiled against future emergencies. It may, however, include amounts taken from stockpiled storage which were actually delivered to the port in previous years.

The figures needed for this study, which attempts to evaluate the effect of food programs on food prices, are the amounts of food actually delivered to families on a month by month basis.

The figures supplied by the U. S. Embassy in Guatemala on the actual distribution of food were given either by quarters or trimesters, depending on the year. Because they come closest to meeting the needs of this study for monthly figures on actual food delivery, they will be used in the following analysis.

One further note needs to be made concerning calendar years, fiscal years and agricultural years. To test hypotheses concerning price effects, agricultural years are desirable, with the year going from harvest to harvest. In Guatemala the calendar year comes very close to satisfying this requirement. It is therefore used in presenting the figures and in doing the analysis in this report.

The U. S. Fiscal year 1976 was the year in which a change was made from using July 1 to June 30 as the basis, to using October 1 to September 30. As a consequence, 1976 is a unique fiscal year, containing five quarters instead of the usual four. Therefore, when comparing it to previous or following years, one-fifth must be subtracted from the figures. If this is done on the assumption that the Froman, Jackson and Gersony figures are for the fiscal rather than calendar year, the figures presented in the above tables converge. This would result in 5,080 tons being subtracted from the 25,400 tons reported, leaving 20,320 tons for a twelve month year. This is a great deal closer to the figure of 18,253 tons obtained from the Embassy figures used in this study.

The Froman, Jackson and Gersony report gives no sources for its figures nor is it clear that only PL-480 foods are included in the amounts reported.

It is possible that foods from other sources were added in or that their figures are based on the amount of food ordered, or received at the port rather than actual amounts distributed. Furthermore, whether they represent fiscal or calendar years is not specified. Considerable effort was expended in checking out the Embassy figures and they are believed to be correct for the amounts of each product distributed during the Calendar Year 1976 by CARE and CARITAS, the two organizations handling PL-480 foods in Guatemala.

In addition to the PL-480 foods, the Reconstruction Committee reported that the Mexican Government distributed 3,500 tons of food in the form of cooked meals distributed in Guatemala City. It also reported that other Central American countries, Mexico, Colombia, Venezuela and Brazil sent food supplies in small quantities amounting on a whole, to between 500 and 1000 tons. In addition, European countries sent food supplies in the form of canned or preserved foods, most of which never left Guatemala City.

In addition to these sources, there were various unconfirmed rumors of food sent from various sources. For example, it was said that a shipload of basic grains was sent from Nicaragua but no one can confirm that this actually took place. Further confusing the figures is the fact that emergency supplies were borrowed from PL-480 stores in Salvador and later returned when emergency food arrived in Guatemala.

At any rate, it is believed that the figures given by the U. S. Embassy represent the actual amount of food distributed in Guatemala during the year shown in the above table. The detailed information upon which this table is based is given in Table 7-7.

Examination of these data will reveal that PL-480 imports increased from 7,335 tons in 1975 to 18,672 tons in 1976. It is very difficult to

Table 7-7

PL-480 Food Products Distributed by CARE and CRS in Guatemala

January 1, 1974 - December 31, 1979
(Reported in thousands of pounds)*

Year	Wheat Flour	CSM (Corn Soy Milk)	Non-Fat Powdered Milk	Soybean Oil	Rolled Oats	Bulgur	Sorghum Grits	WSDM (Whey Soy)	Yellow Corn	WSB (Wheat Soy Blend)	Incaparina	Soy Fortified Rice	Pinto Beans	Total in Thousands of pounds	Total Metric Tons**
1974	4,595	3,825	338	1,181	386	460	424	38	493	592	0	0	0	12,332	5,594
1975	3,884	3,265	259	1,039	622	2,017	1,710	1,183	1,102	979	103	0	0	16,163	7,331
1976	6,821	5,400	1,715	2,522	2,395	3,027	2,102	1,626	3,712	5,291	9	0	5,624	41,146	18,664
1977	5,662	1,865	3,981	2,405	1,253	3,069	1,826	1,828	2,216	1,845	0	0	5,308	31,268	14,183
1978	4,724	6,646	4,291	2,724	1,723	2,651	615	1,086	0	649	0	0	41	25,150	11,408
1979	4,255	6,444	5,706	3,094	1,213	1,618	0	0	0	731	0	3,905	0	26,964	12,231

* Source: Food for Peace Office, U. S. Embassy, Guatemala City, 1980.

** 1 metric ton = 2204.6 pounds.

estimate the amount actually distributed for emergency purposes as opposed to regular purposes. Figures supplied by CARE and Catholic Relief indicate that approximately 1/3 of the total amount was used as emergency supplies and the remainder was distributed through regular maternal-child care, school and church programs that had been operating before the earthquake. Again the Froman, Jackson and Gersony report disagrees by reversing these proportions.

In the long run, it is best to regard all PL-480 food as serving some emergency relief purpose during the first 90 days after the earthquake. After that date it served other purposes. In addition to being distributed through regular on-going food programs, PL-480 food was used in connection with "food for work" programs. Many of these food for work projects were carried out after the emergency was over and were all actually "reconstruction" projects. Such programs contributed to the reconstruction of community facilities and at the same time represented an economic gain to those persons participating which could also aid in reconstruction at the household level.

For example, CARE reported that between February and May 1976 they distributed 1,384,817 pounds of PL-480 commodities in food for work programs at a rate of 5.25 pounds per man day. This accounts for 263,774 man days of labor. They report that workers were employed 14 days on an average, providing a work force of 18,800 workers. These workers were employed primarily in tearing down potentially dangerous ruins of public buildings and in road clearing operations. Instructions to field staffs specifically ruled out payment for work on private homes.

During the period between June 1976 and January 1977, an additional

3,712,429 pounds of PL-480 commodities were used by CARE in food for work programs, providing an additional 707,129 man days of labor and an average monthly work force of 6,300 workers. This work force was used to repair roads and to erect temporary school buildings.

According to CARE, all of the emergency food it distributed was through such work programs. The remainder distributed by them flowed through regular food programs. Within these programs larger than normal amounts of food were distributed in order to reach more malnourished pre-school children than had been enrolled in the programs in previous years.

It can be seen that PL-480 food distribution had multiple goals. It was not only intended to feed hungry people but also to provide a resource which would provide a work force to assist in reconstruction. Furthermore, food for work provided income in kind that could release other income for use in meeting other emergency needs created by the earthquake.

As in all emergency programs carried out on a large scale in disaster situations, there were no doubt abuses. Undoubtedly some people received food for work who did not actually work or who worked on personal projects rather than public ones. Nevertheless, rubble was cleared, and dangerous structures were torn down and roads repaired through the use of a labor force paid by food for work.

Notwithstanding these facts, the question still remains as to whether the food distribution program was so massive and so mismanaged as to have a negative impact on food prices and food production. In order to gain some perspective on this question before looking at figures on food prices and on what happened to food production, it will be useful to compare PL-480 imports to agricultural production figures. This is done in Table 7-8.

TABLE 7-8
 Comparison of Basic Grain Production with PL-480 Imports 1974-1979
 (metric tons)

	Corn			Beans			Rice			Sorghum		
	Production	PL 480	%									
1974	698,000	178	0.02	67,000	-	-	47,000	-	-	47,000	192	0.41
1975	881,000	500	0.06	86,000	-	-	61,000	-	-	61,000	776	1.27
1976	842,000	1,684	0.20	78,000	2,551	3.27	50,000	-	-	50,000	953	1.91
1977	821,000	1,006	0.12	57,000	2,409	4.22	49,200	-	-	49,200	829	1.68
1978	842,000	-	-	80,500	19	0.02	64,700	-	-	64,700	279	0.43
1979	820,800	-	-	77,000	-	-	63,500	1,772	2.79	63,500	-	-

This tabulation compares food production figures for four basic grains with the quantities of the same food product distributed by CARE and Catholic Relief during the period 1974 to 1979. In the first column it is seen that in 1974 the amount of PL-480 corn distributed amounted to 0.02 percent of the corn produced in Guatemala that year. In other words, PL-480 corn amounted to two-hundredths of one percent of annual production. In the year of the earthquake, 1976, PL-480 corn reached 0.20 percent of the corn produced. While this figure is ten times as large as the 1974 figure, the amount is only two-tenths of one percent of the total corn production. The significance of this figure is that the supply of corn available for consumption in Guatemala was increased by this amount by the addition of PL-480 products. This increase is the one that would have a price impact if any occurred. Since it is proportionately small, only a small impact on prices should be expected. Furthermore, since there was an earthquake caused loss of five percent in agricultural products reported by the Emergency Committee on the basis of field surveys, the price impact should be to moderate the effects which would have occurred due to disaster related losses. In short, the effects of PL-480 foods would have been a reduction in "windfall" profits which would have occurred due to this loss.

In the case of beans and sorghum, it will be seen that the percentages are much greater. For beans the PL-480 figure is 3.27%, a significant percentage of the total national production and for sorghum the figure 1.91% is also high. Here larger price impacts should be expected. In the case of rice, none was distributed through PL-480 sources and therefore no price impact is expected.

This table shows, among other things, that 1975 had been an unusually

productive agricultural year for corn, beans, rice and sorghum. Table 7-9 shows the percentage increase in the production of these products year by year from 1970 to 1981. These figures are for agricultural years rather than calendar years. This means that the food on hand for consumption by earthquake victims following the earthquake was that produced in 1975-76. Production of corn that year was 39.26 percent higher than the previous year. Beans were up 28.00 percent, rice 35.29 percent and sorghum 29.79 percent. The data on corn and beans are summarized in Figures 7-1 and 7-2.

As a consequence of this large harvest, it would be expected that prices would have been declining sharply at the time of the earthquake. The five percent loss of agricultural products due to earthquake damage would have moderated this decline, while PL-480 food distribution should have had the effect of overcoming a portion of the five percent loss, resulting in slightly less of an upward change than would have been expected as a result of the disaster caused food loss.

Of further interest is the fact that during the two years following the earthquake, food production dropped. It declined from the 1975 high by 4.42 percent for corn, 9.30 percent for beans, 71.74 percent for rice and 18.63 percent for sorghum in 1976-77, and by a further 7.13 percent for corn, 26.92 percent for beans, 23.08 percent for rice and 2.00 for sorghum in 1977-78. These declines were probably produced by many factors working together. For example, lower prices produced by the bumper crop of 1975-76 would have a discouraging effect on agricultural production. Weather conditions represent a second factor. During the two years following the earthquake, moderate droughts occurred two summers in a row. Finally, there is substantial evidence that many farmers sold their labor

TABLE 7-9

Production of Four Basic Foods in Guatemala 1970-1980 Showing Changes in Production

Each Year Compared to the Previous Year (In Thousands of Metric Tons)

Year	Beans		Corn		Rice		Sorghum	
	1000 Metric Tons	Percent Change from Last Year	1000 Metric Tons	Percent Change from Last Year	1000 Metric Tons	Percent Change from Last Year	1000 Metric Tons	Percent Change from Last Year
1970-71	70	-	760	-	26	-	34	-
1971-72	77	+10.00	746	+ 1.84	37	+46.15	35	+ 2.94
1972-73	55	-28.82	685	-10.05	40	+ 5.26	45	+28.57
1973-74	67	+21.82	701	+13.28	40	0.00	46	+ 2.22
1974-75	67	0.00	698	- 0.42	34	-15.00	47	+ 2.17
1975-76	86	+28.00	881	+39.26	46	+35.29	61	+29.79
1976-77	78	- 9.30	842	- 4.42	13	-71.74	50	-18.03
1977-78	57	-26.92	821	- 7.13	16	+23.08	49	- 2.00
1978-79	80	+42.11	944	+14.98	27	+68.75	65	+32.65
1979-80	77	- 4.94	1,058	+12.07	39	+44.44	64	- 1.54
1980-81	81	+ 5.19	1,050	- 0.75	45	+15.38	78	+21.88

Source: Agricultural Attache, U. S. Embassy, Guatemala
verified against FAS/USDA Report FG-4-81, dated 28 Jan. 1981

FIGURE 7-1
METRIC TONS OF CORN
PRODUCED ANNUALLY 1970 - 1980

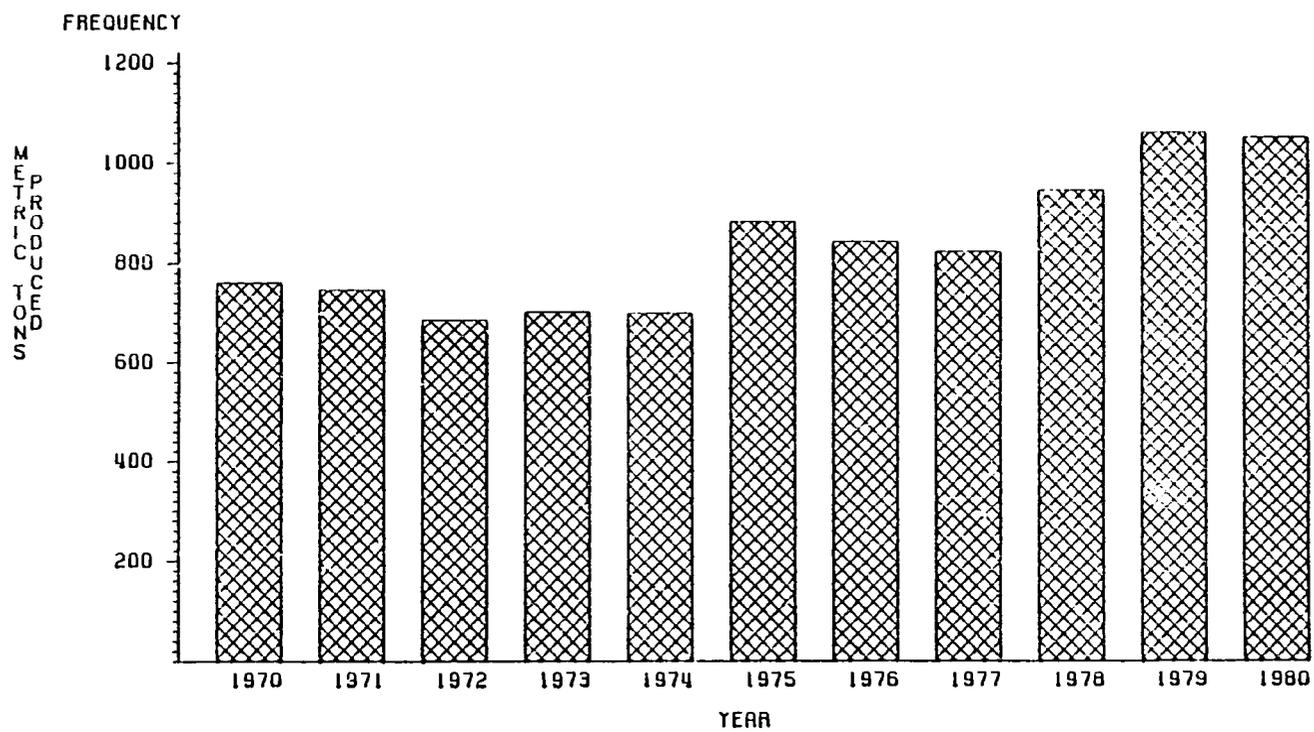
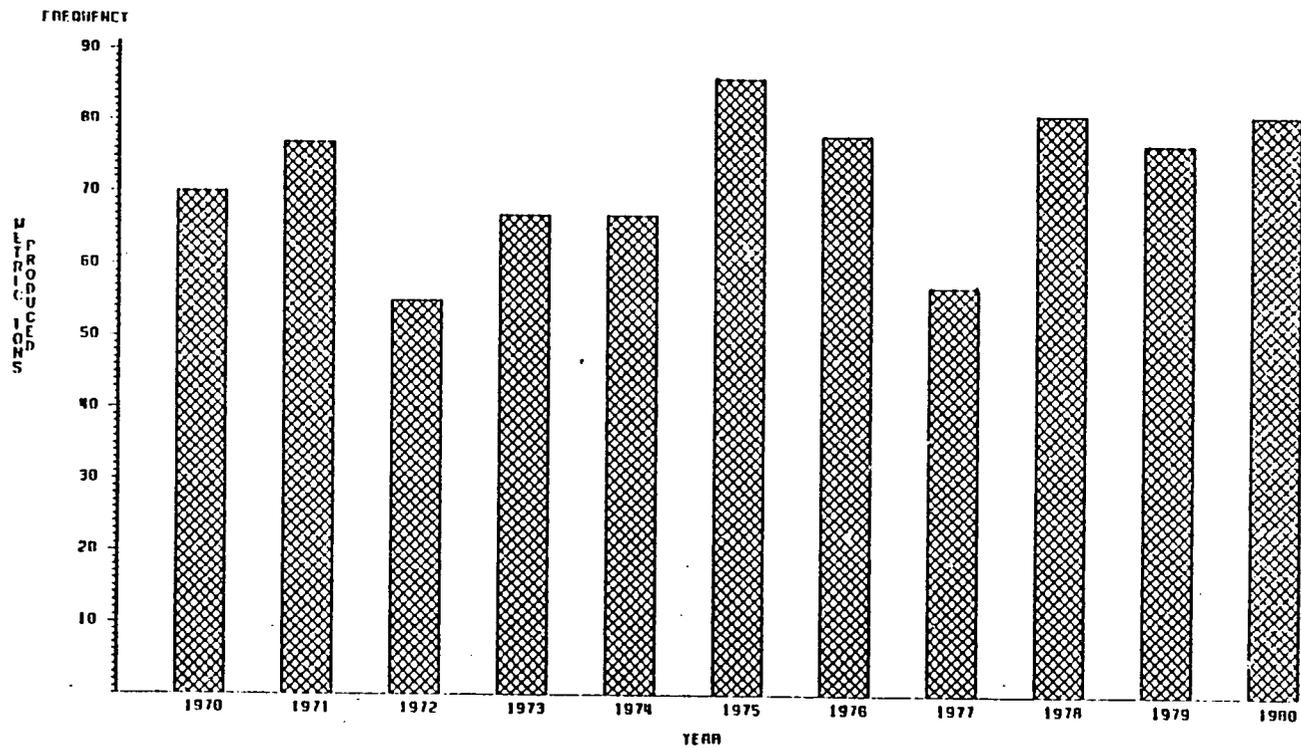


FIGURE 7-2
METRIC TONS OF BEANS
PRODUCED ANNUALLY 1970 - 1980



in the reconstruction process, withdrawing it from agricultural production. Data obtained from interviews with our sample of households shows that about four percent fewer people planted corn in 1976 than before the earthquake and about two percent less the following year. Furthermore, interview data show that 33.8% of our respondents worked on reconstruction projects for pay.

Evidence of the fact that one cause of the drop in production was a withdrawal of labor from agriculture and shifting it into reconstruction is the fact that production jumped back to near to or above pre-earthquake levels for all products except rice in 1978-79. By this time reconstruction programs had slowed down and opportunities for employment in such activities had severely decreased. This table shows that since 1978, for the most part, agricultural production has remained high.

It is of course difficult to say whether the earthquake had an effect on agricultural production, given the data available, since other factors such as normal price fluctuation or weather cycles could produce the observed post-earthquake two-year drop in production. We are inclined, however, to believe that the withdrawal of labor from agricultural production for use in reconstruction played a role in the observed reduction in agricultural production.

It should be remembered, however, that even though production was down slightly during the two years following the earthquake, production was still proportionately high compared to the years before 1975-76. From 1970-71 to 1974-75 the average annual production of corn was 711 thousand tons. During the two years following the earthquake it averaged 831 thousand tons. Furthermore, since 1975-76, the last pre-earthquake year, corn production has averaged 933 thousand tons, a substantial increase of 31 percent over the pre-earthquake years. Ordinarily this increase should have resulted in

lower prices for agricultural products since population was not growing at this rate. However, there were a number of factors contributing to inflationary pressures on prices including increased costs of all products related to world inflationary trends associated with oil price increases and perhaps more importantly, the sudden influx of hundreds of millions of dollars of disaster relief funds.

In the next section of this report data on actual prices, agricultural production and PL-480 food distribution will be examined using sophisticated statistical techniques to determine whether or not there was an actual change in prices following the earthquake and whether their price change, if any, can be attributed to PL-480 food distribution.

Examination of Prices for Corn and Beans

Monthly price data for black beans and for two types of corn, white and yellow, were obtained from the Guatemalan Ministry of Agriculture. These figures represent average monthly prices for the whole country and indicate neither weekly fluctuations nor local variations in prices. They are gross statistics reflecting what happened to prices for the country or the average, month by month, beginning in January, 1973 and continuing through August of 1979.¹ All prices are for one hundred weight units and thus reflect prices paid the "farmer," not per pound prices paid by the consumer.

Until transportation was restored and markets returned to "normal," price fluctuations may have been severe in some isolated markets.² These local variations would not appear in these national level statistics.

¹The Ministry of Agriculture collects prices from all major regional markets in constructing these price data.

²Some food critics argue that this was a short time, perhaps a matter of a couple of weeks.

However, it is believed that transportation lines to and from Guatemala City were restored within one or two months and that prices across regions stabilized within a relatively short time.

Data on PL-480 food distribution of corn and beans come from the U.S. Embassy in Guatemala City. As noted above, there is some possible disagreement as to the reliability of these figures. However, since the analysis will focus on monthly variations over a several year period, if errors in the relative amounts distributed during these months are relatively constant, the statistical effects of PL-480 food distribution will remain the same, regardless of which figures are used. In other words, if the differences between the two sets of figures represent some constant multiplier, the estimations of PL-480 effects in the statistical models will not differ (though certainly estimates for particular months could differ).

Production data were subject to considerable variation, depending on source. Three separate sources were consulted in an attempt to verify these data: The Guatemalan Ministry of Agriculture (MOA), the Food and Agriculture Organization of the United Nations (FAO), and the Economics Research Service of the U.S. Department of Agriculture (ERS). Upon careful examination, the ERS figures appeared most reliable. The ERS utilizes a variety of sources in compiling its figures, including "...U. S. Agricultural attaches, FAO, and other international organizations' commodity reports, and estimates made by country analysts in the International Economics Division of the ERS, USDA." Confidence in these data as opposed to those obtained from other sources was born out empirically when all three sources were "tested" for their fit to the price data using a variety of statistical models that employed several different time lags. In these manipulations ERS production data conformed substantially better to the

price data than data from other sources.

In sum, the following analysis is based on what are considered to be the best available data after making many inquiries and comparisons of figures from many different sources.

PL-480 Distribution of Beans and Price Impact

The U. S. Embassy in Guatemala reports that approximately eleven million pounds of pinto beans were distributed by CARE and CRS from February 1976 through March 1978. Ninety-five percent of this amount was distributed between July 1976 and June 1977, as is shown in Table 7-10 and Figure 7-3. Prices for black beans before the earthquake (January 1973 through January 1976) averaged \$15.98 per hundred weight. For the period of highest distribution levels (June 1976 through July 1977), the average price was \$16.79 per hundred weight. Table 7-11 shows monthly and yearly averages. Figure 7-4 depicts monthly prices graphically. Before examining any possible relationship between PL-480 bean distribution and prices, a more detailed look at actual prices is needed. Bean prices for the 1975 calendar year averaged \$17.42. In January 1976, the impact of 1975-1976 harvests was felt as prices fell to \$15.93 per hundred weight. In February, the month of the earthquake, prices jumped to \$17.12. This was probably due to hoarding of food and perhaps some speculation in the grain market since in nearly all other years prices for the month of February continued to fall. Between March 1976 and March 1977, prices fluctuated between fourteen and sixteen dollars per hundred weight. Beginning in March 1977, with beans at \$15.28, a steep climb in price began, peaking at \$31.52 in November of that same year.

The average monthly increase during this period would be over \$2.00 per month. Prices more than doubled over an eight month period. Let

Table 7-10

CARE and CRS Distribution of Commodities in Guatemala
July 1973 to March 1980 (in thousand pounds)

Period	Wheat Flour	CSM (Corn Soy Milk)	Non - Fat Powdered Milk	Soybean Oil	Rolled Oats	Bulgur	Sorghum Grits	WSDM (Whey Soy)	Yellow Corn	WSB (Wheat Soy Blend)	Incaparina	Soy Fortified Rice	Pinto Beans	TOTAL
Jul-Dec. 73	2,364	1,440	537	503	255	138	-	-	-	390	-	-	-	5,617
Jan-Jun. 74	2,283	1,918	337	667	63	197	-	-	-	536	-	-	-	6,001
Jul-Dec. 74	2,312	1,907	1	514	323	263	424	38	493	56	-	-	-	6,331
Jan-Jun. 75	2,894	1,665	86	521	101	1,368	1,090	432	536	275	19	-	-	9,077
Jul-Sep. 75	609	811	107	301	200	426	442	421	14	321	56	-	-	3,708
Oct-Dec. 75	381	789	66	217	231	223	178	330	552	383	28	-	-	3,378
Jan-Jun. 76	4,045	2,814	158	1,267	1,257	1,458	983	1,144	795	3,209	9	-	69	18,108
Jul-Sep. 76	2,197	1,676	909	810	805	978	751	175	1,493	1,211	-	-	3,143	14,150
Oct-Dec. 76	579	910	648	445	333	591	368	307	1,424	871	-	-	2,412	8,888
Jan-Mar. 77	1,420	170	703	444	12	733	639	470	1,466	999	-	-	2,813	9,869
Apr-Jun. 77	1,442	560	1,200	738	605	676	157	364	722	448	-	-	2,006	8,918
Jul-Sep. 77	1,567	461	1,083	568	203	949	296	410	28	71	-	-	430	6,066
Oct-Dec. 77	1,233	674	995	655	433	711	734	584	-	327	-	-	59	6,415
Jan-Mar. 78	1,783	1,328	694	636	482	741	498	884	-	212	-	-	41	7,299
Apr-Jun. 78	1,288	2,011	1,078	676	324	581	94	165	-	114	-	-	-	6,331
Jul-Sep. 78	1,278	1,771	1,320	758	523	248	21	29	-	149	-	-	-	6,097
Oct-Dec. 78	375	1,536	1,199	654	394	1,081	2	8	-	174	-	-	-	5,423
Jan-Mar. 79	771	2,117	1,261	692	163	1,516	-	-	-	160	-	-	-	6,680
Apr-Jun. 79	1,911	1,161	1,336	825	188	76	-	-	-	200	-	1,157	-	6,854
Jul-Sep. 79	871	1,595	1,500	807	450	17	-	-	-	179	-	1,115	-	6,534
Oct-Dec. 79	702	1,571	1,609	768	412	9	-	-	-	192	-	1,633	-	6,896
Jan-Mar. 80	264	1,138	797	408	376	5	-	-	-	224	-	750	-	3,962

FIGURE 7-3
 THOUSANDS OF POUNDS
 PINTO BEANS
 DISTRIBUTED THROUGH PL480 PROGRAMS

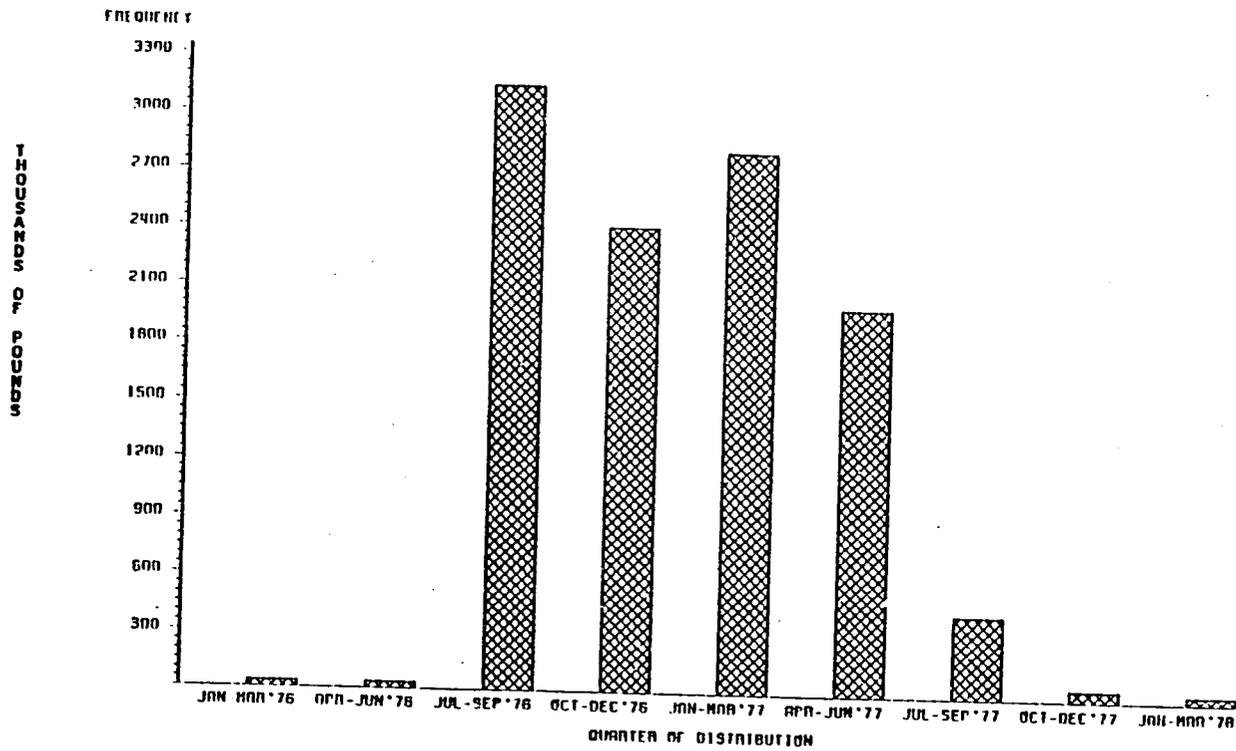


TABLE 7-11

Average Monthly Prices per Hundred Weight for Black Beans

<u>Year</u>	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>	<u>Annual Average</u>
1973	11.15	12.08	13.75	12.47	12.66	14.85	14.33	10.66	12.36	15.48	18.24	17.08	13.76
1974	16.39	16.13	16.61	15.53	16.09	16.86	17.63	14.68	15.20	17.61	19.61	18.26	16.77
1975	17.88	17.24	17.76	17.33	17.15	18.30	19.12	17.75	17.00	16.57	16.79	16.17	17.42
1976	15.93	17.12	15.54	14.15	14.36	15.17	15.18	14.06	14.05	14.01	15.47	15.92	15.08
1977	15.19	15.28	15.28	15.91	16.93	18.99	20.95	20.83	21.02	24.35	31.52	28.24	20.37
1978	20.48	25.55	26.29	23.09	22.90	27.22	28.27	23.60	20.57	21.05	21.22	21.12	23.44
1979	20.32	19.86	19.53	18.75	18.22	19.24	19.54	20.83					

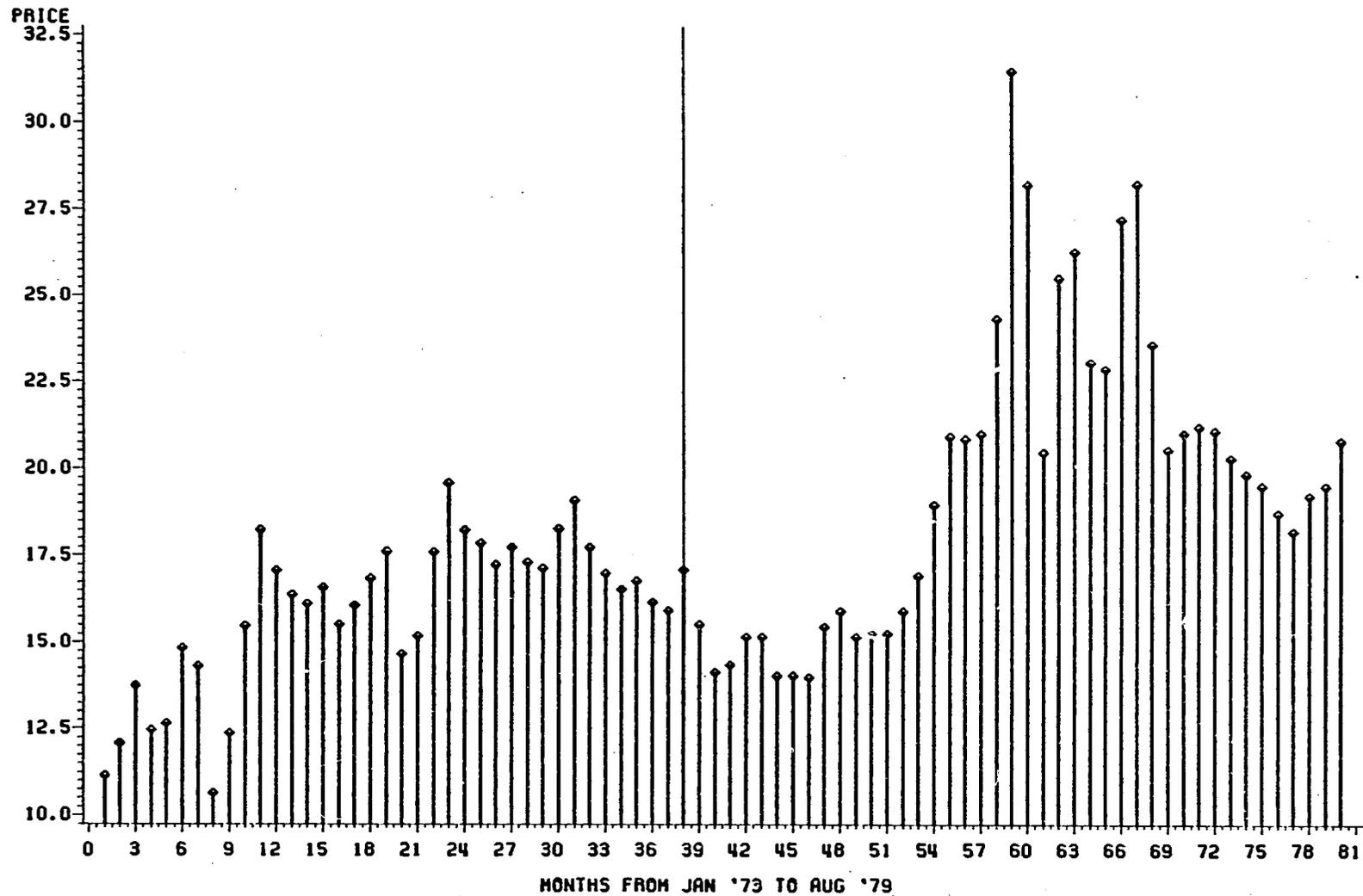
Source: Indeca.

FIGURE 7-4

BLACK BEANS

MONTHLY PRICES PER HUNDRED-WEIGHT

JANUARY 1973 - AUGUST 1979



MONTH #38 IS FEB. 1976

us now see what factors help account for these changes in price.

The simplest way of statistically testing for a PL-480 distribution impact on price would be a regression equation of the form:

$$\text{PRICE}_t = \alpha + \beta_1 (\text{Pre E.Q. Price Trend}_t) + \beta_2 (\text{Impact Price Trend}_t) + \beta_3 (\text{Amount of PL-480}_t) + \beta_4 (\text{Post Impact Price Trend}_t) + U_t,$$

where the three trends are time trend variables and U_t is a random disturbance term. The time trend variables are simply the upward or downward trend in prices over the time period in question: pre-earthquake, the time period where earthquake/PL-480 food related impact might have occurred, and the time period after which this impact may be presumed to have ended.

The inclusion of the time trend variables has the statistical consequence of removing the effects of linear time trends associated with such things as inflation and fluctuation in supply from the data so that β_3 represents the linear effect of PL-480 food distribution on prices. These trend variables can be interpreted as proxies for excluded variables which have linearly affected prices over time. That is, they remove the effects of such things as inflation, and changes in production which affect supply, and therefore, price.

While this model has the advantage of simplicity, there may be other factors which are related to both price and the quantity of PL-480 food distribution. Obviously, the level of production should be included since we wish to separate the effects of bumper harvests in the 1975-76 agricultural year from the effects of PL-480 food distribution programs. We also know that there are normal seasonal variations during the year due to when harvest occurs, holding back and storing part of the harvest for sale at a later date, and other reflections of "normal" marketing activities. Thus, in order to estimate PL-480 impact fairly, we should remove these normal seasonal cycles or variations of price during the year.

This is accomplished by including quarterly effects in the model.¹ While our model is now somewhat more complex, the data are better fitted by the model and the measure of PL-480 impact is the net effect after removing normal quarterly changes in prices.

One problem remains before the model is complete. This problem is to define the appropriate time periods. For the pre-earthquake time trend this is simply the thirty-seven months from January 1973 through January 1976. The appropriate impact time period is, however, more problematic. Selecting a time period which is either too long or too short could lead to erroneous conclusions concerning non-PL-480 related earthquake effects. A compromise solution is to include two possible impact periods. These periods should be in increments of twelve months since it takes us to the same point in the agricultural cycle. Hence, our model now takes the following form:

$$\begin{aligned}
 \text{PRICE}_t = & \alpha + \beta_1 (\text{Jan. '73-Jan. '76 trend}_t) \text{ (pre earthquake period)} \\
 & + \beta_2 (\text{Feb. '76-Jan. '77 trend}_t) \text{ (first impact yr. following earthquake)} \\
 & + \beta_3 (\text{Feb. '77-Jan. '78 trend}_t) \text{ (second impact yr. following earthquake)} \\
 & + \beta_4 (\text{Feb. '78-Aug. '79 trend}_t) \text{ (post earthquake period)} \\
 & + \beta_5 (\text{Production}_t) \text{ (amount of beans produced)} \\
 & + \beta_6 (\text{PL-480 Distribution}_t) \text{ (amount of PL-480 beans distributed)} \\
 & + \beta_7 (\text{Quarter 1}_t) \text{ (quarterly effect of first quarter)} \\
 & + \beta_8 (\text{Quarter 2}_t) \text{ (quarterly effect of second quarter)} \\
 & + \beta_9 (\text{Quarter 3}_t) \text{ (quarterly effect of third quarter)} \\
 & + U_t
 \end{aligned}$$

Each β value in this equation ($\beta_1 - \beta_9$) represents the amount of change in price we may expect for each unit of increase in the independent variable.

¹Quarterly effects for black beans are based on the calendar year.

For the time trend variables ($\beta_1 - \beta_4$) the units are months; for production, the unit is one metric ton; for PL-480 food distribution, one thousand pounds; and the quarterly effects represent deviations from the fourth quarter's effect on prices. This renders the least constrained test of the hypothesized impact.

If we examine the regression in Table 7-12 we can see that the estimate for PL-480 distribution effect on bean prices is $-.003$.^{1,2} This may be interpreted as the effect of increasing PL-480 distribution one thousand pounds on detrended prices, controlling for yearly production levels and normal quarterly fluctuations. In other words, an increase of one thousand pounds of PL-480 beans would produce, on the average, three tenths of one cent reduction in the price of black beans per hundred weight.

This model "explains" roughly 62% of the variance in prices over the six and 3/4 year period. It must be remembered that this leaves 38% of the variance unexplained. No doubt petroleum prices have at times had great sudden impacts on the market, and these are only partly taken into account with the time trend variables. In addition, the FAO apparently was working with the MOA to stabilize prices after about 1975. It is unclear what impact, if any, these policies had on prices, but the possibility exists that their activities are both covarying with PL-480 distribution levels for a time (and are thus absorbed into this estimate) and that such activities

1

Significant first order auto correlation necessitated the use of GLS estimation techniques. The AUTOREG procedure of SAS (Statistical Analysis System) was utilized in all regressions reported in this paper.

2

It should be noted that several models were used in attempting to "best fit" the data. Lagging various numbers of months and including PL-480 - quarterly interaction effects failed to provide any significant increment to R^2 or substantively different results.

TABLE 7-12

Regressions of Price of Black Beans/100 wt. on PL-480 Food Distribution and Control Variables

First Order Auto-regressive Solutions:

With PL-480 Effect: $R^2 = .6167$

Without PL-480 Effect: $R^2 = .5090$

<u>Component</u>	<u>β value</u>	<u>SEE</u>	<u>t</u>	<u>Prob.</u>	<u>β value</u>	<u>SEE</u>	<u>t</u>	<u>Prob.</u>
Intercept	23.4892	2.3241	10.107	.0001	23.3044	2.5850	9.015	.0001
Pre-E.Q. trend	.1883	.0480	3.923	.0002	.1713	.0548	3.125	.0026
Feb.'76-Jan.'77 trend	.1482	.0368	4.031	.0001	.1149	.0401	2.866	.0055
Feb.'77-Jan.'78 trend	.1726	.0255	6.771	.0001	.1398	.0282	4.960	.0001
Feb.'78-Aug.'79 trend	.1446	.0179	8.065	.0001	.1422	.0210	6.763	.0001
PL-480 *	-.0030	.0012	-2.464	.0162	-	-	-	-
Production **	-.1410	.0357	-3.953	.0002	-.1344	.0391	-3.440	.0010
Quarter #1 ***	-1.7488	.7070	-2.474	.0158	-1.7736	.7285	-2.434	.0174
Quarter #2 ***	-2.4204	.7556	-3.203	.0020	-2.5165	.7933	-3.172	.0022
Quarter #3 ***	-1.9802	.7087	-2.794	.0067	-2.0223	.7318	-2.764	.0073

*PL-480 effects are lagged one month and measured in thousands of pounds.

**Production figures for black beans are entered in October and are measured in metric tons.

***Quarterly effects are defined in terms of the calendar year.

contribute to the "noise" left in the data. An additional possibility is that large quantities were held back during the first few months after the earthquake and later released into the market in larger than normal amounts.

Figures 7-5 and 7-6 summarize pictorially the actual and predicted prices and the estimated PL-480 impact over time. Figure 7-5 graphs actual prices and predicted prices by month. Here, noise in the data is most evident during the pre-earthquake time period while the fit of the model to the data during the impact period is actually rather good. Figure 7-6 represents the estimated PL-480 effect plotted over time.¹ Those points above the "zero" line represent decrements to price while those below the line represent increments to price. One can readily see that there is a fair amount of dispersion about this line. And while we can think of no arguments for how PL-480 imports could raise prices, such points are clearly evident in this plot. We can only remind the reader that a certain amount of noise seems unavoidable in models utilizing data such as these and that estimates are "averaged" and may be in error for any specific month.

Nevertheless, it seems fairly conclusive that PL-480 distribution had a measurable impact on the prices of black beans. This impact was on the order of three-tenths of a cent per 1000 pounds increase in levels of distribution. During some months (most likely August - October 1976) prices may have been affected by as much as \$2.15 per hundred weight. It should

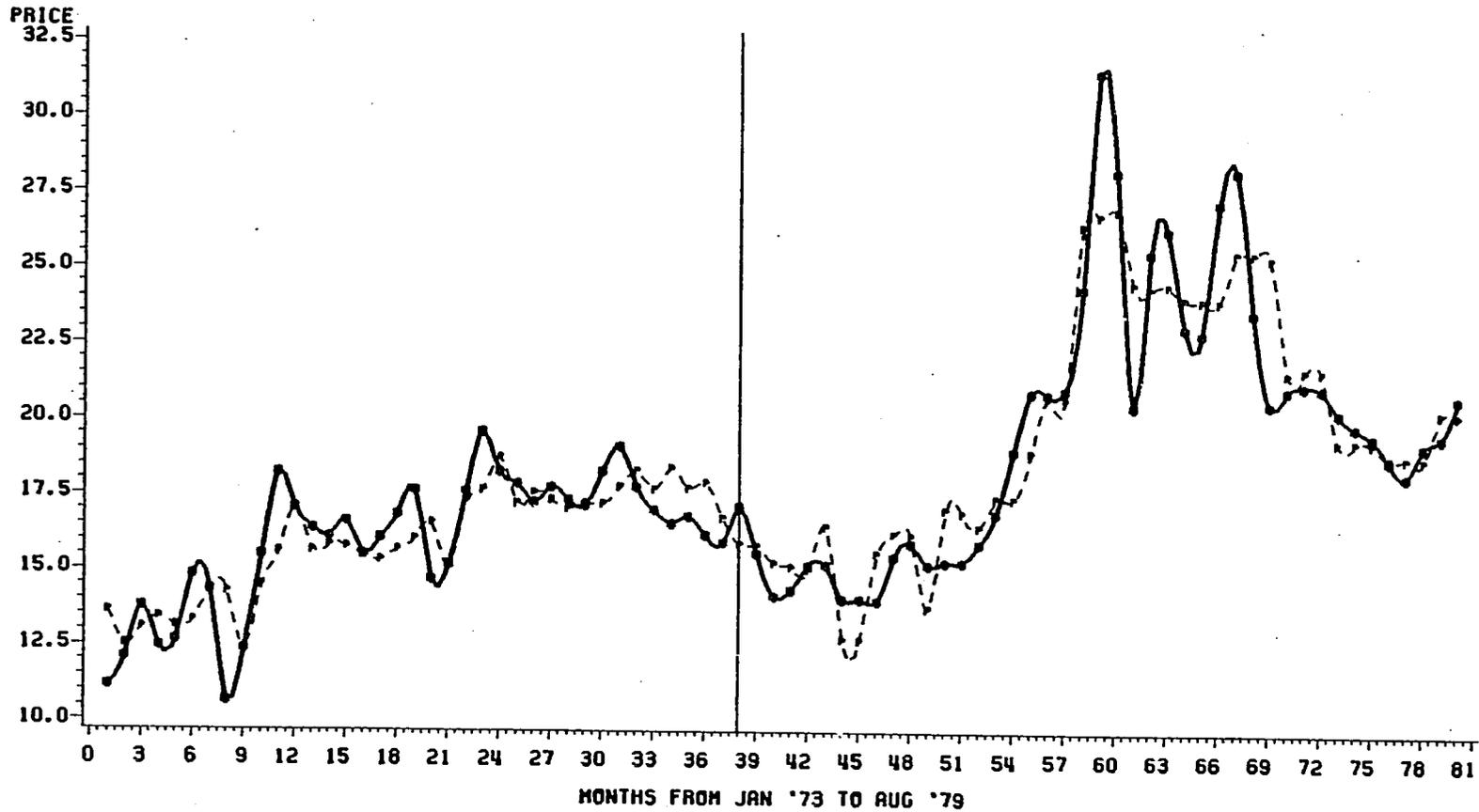
¹A plot of these values based on a model utilizing all 80 time points results in some distracting estimates prior to the time that actual PL-480 distributions of beans began. The autoregressive model was therefore re-estimated for two time periods: (1) the pre-earthquake and pre-distribution time period - through January, 1976; and (2) the period from February, 1976 through August, 1979. Estimates of the PL-480 effect were nearly identical for the model utilizing all 80 time points (-.0034) and the model utilizing only the post earthquake period (-.0030). It is interesting to note that the R^2 for the January 1973 through January 1976 period is only .3568, while the model for the February 1976 through August 1979 time period has an R^2 of .8396. The plot of differences between a model containing the PL-480 effect and a model not containing such an effect (Figure 6) represents point estimates from the February 1976 through August 1979 time period.

FIGURE 7-5

BLACK BEANS

ACTUAL & PREDICTED MONTHLY PRICES

JANUARY 1973 - AUGUST 1979



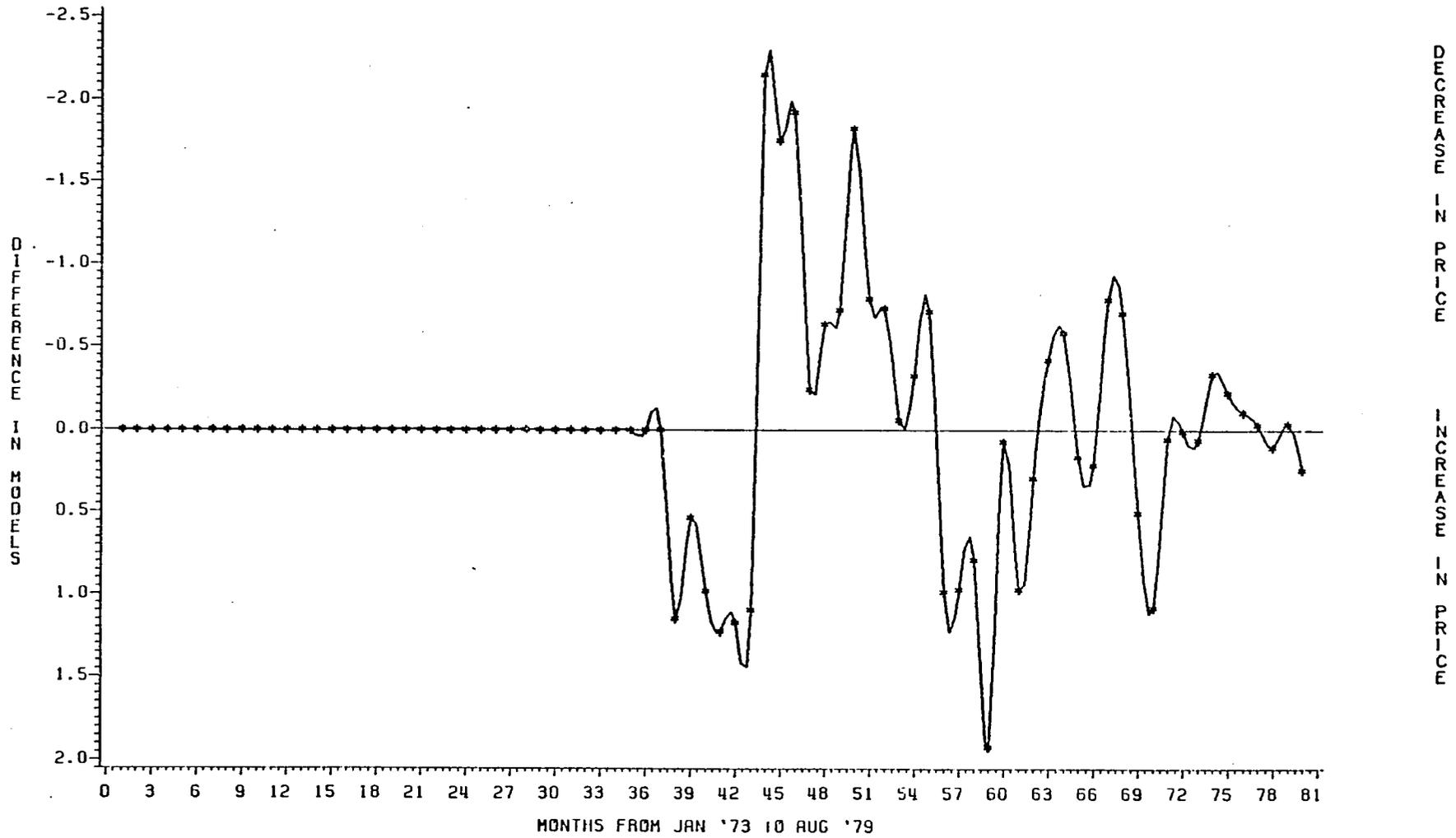
HEAVY LINE IS ACTUAL PRICE
LIGHT LINE IS PREDICTED PRICE

VERTICAL LINE AT
MONTH 38 = FEB. 1976

FIGURE 7-6

BLACK BEANS

ESTIMATED DIFFERENCES IN PRICE ASSOCIATED WITH
PL480 BEAN DISTRIBUTION: JANUARY 1973 - AUGUST 1979



MONTH #38 IS FEB.1975

also be noted that prices one year later seemed to have more than made up these losses and in fact are higher than the overall model would predict,

PL-480 food distribution's impact accounts for some of the variance during the impact period. This is evident in the increment to R^2 . Could there have been other earthquake related effects on price? The answer is undoubtedly yes, though we have no direct measures of these other variables. The closest we can get to measuring these effects are our linear time trend variables; that is, one way of defining an earthquake effect would be a change in trend during the earthquake period. In the case of beans, even though the estimates appear to be substantially lower during the first twelve months after the quake, there are not statistically significant differences between the estimates.

Price Impact of PL-480 Distribution of White and Yellow Corn

Approximately seven and one-half million pounds of yellow corn were distributed by CARE and CRS from January 1976 through September 1977.¹ Eighty-seven percent of this was distributed by March of 1977. Table 7-10 and Figure 7-7 show that some corn was distributed prior to the earthquake (July, '74 - Dec. 1975). The effects of this corn distribution in regular PL-480 food programs are included along with corn handed out after the earthquake. While only yellow corn was distributed, white and yellow corn may be considered substitutable and it is thus reasonable to assume that an impact could be detected on either type corn. Though very similar in their outcomes, the analyses are presented in separate tables.

Tables 7-13 and 7-14 present the regression analyses of corn prices on essentially the same regressors used in the analysis of bean prices. Table 7-15 and Figure 7-8 give average prices for white corn - 1973-1979. Table 7-16

¹U. S. Embassy figures.

FIGURE 7-7
 THOUSANDS OF POUNDS
 YELLOW CORN
 DISTRIBUTED THROUGH PL480 PROGRAMS

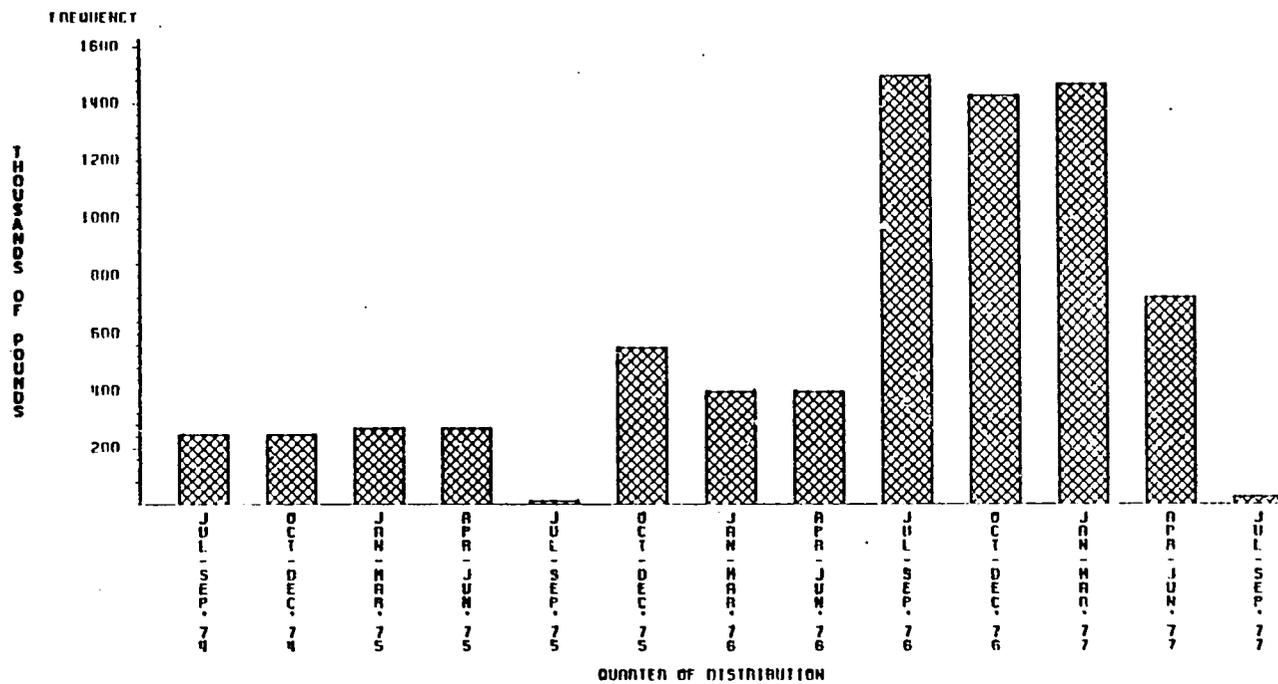


TABLE 7-13

Regressions of Price of White Corn/100 wt. on PL-480 Distribution and Control Variables

First Order Auto-regressive Solutions:

With PL-480 Effects: $R^2 = .6779$

Without PL-480 Effect: $R^2 = .6740$

<u>Component</u>	<u>β value</u>	<u>SEE</u>	<u>t</u>	<u>Prob.</u>	<u>β value</u>	<u>SEE</u>	<u>t</u>	<u>Prob.</u>
Intercept	9.3789	1.2952	7.448	.0001	9.7001	1.2358	7.849	.0001
Pre E.Q. Trend	.0826	.0132	6.251	.0001	.0800	.0130	6.150	.0001
Feb.'76-Jan.'77 trend	.0543	.0123	4.408	.0001	.0480	.0115	4.170	.0001
Feb.'77-Jan.'78 trend	.0605	.0086	7.011	.0001	.0591	.0085	6.911	.0001
Feb.'78-Aug.'79 trend	.0558	.0077	7.252	.0001	.0570	.0076	7.465	.0001
PL-480 *	-.0011	.0008	-1.414	.1617	-	-	-	-
Production **	-.0065	.0019	-3.492	.0008	-.0070	.0018	3.806	.0003
Quarter 1 ***	.1220	.1915	.637	.5262	.1209	.1926	.628	.5322
Quarter 2 ***	1.0673	.2047	5.213	.0001	1.0787	.2055	5.248	.0001
Quarter 3 ***	.9265	.1912	4.844	.0001	.9325	.1923	4.848	.0001

339

*PL-480 in thousands of pounds.

**Production measured in metric tons; entered in October.

***Quarterly effects are dummy variables expressed as deviations from the fourth quarter. Quarter 1 begins in December for this model.

TABLE 7-14

Regressions of Price of Yellow Corn/100 wt. on PL-480 Food Distribution and Control Variables

First Order Auto-regressive Solutions:With PL-480 Effects: $R^2 = .5726$ Without PL-480 Effect: $R^2 = .5702$

<u>Component</u>	<u>β value</u>	<u>SEE</u>	<u>t</u>	<u>Prob.</u>	<u>β value</u>	<u>SEE</u>	<u>t</u>	<u>Prob.</u>
Intercept	8.0602	1.3498	5.971	.0001	8.3785	1.3124	6.384	.0001
Pre-E.Q. Trend	.0900	.0146	6.174	.0001	.0883	.0144	6.148	.0001
Feb.'76-Jan.'77 trend	.0552	.0131	4.208	.0001	.0506	.0124	4.080	.0001
Feb.'77-Jan.'78 trend	.0569	.0095	6.014	.0001	.0560	.0094	5.982	.0001
Feb.'78-Aug.'79 trend	.0503	.0084	5.997	.0001	.0516	.0083	6.235	.0001
PL-480 *	-.0009	.0008	-1.116	.2681	-	-	-	-
Production **	-.0048	.0020	-2.400	.0190	-.0053	.0019	-2.706	.0085
Quarter 1 ***	.1449	.1951	.742	.4603	.1455	.1954	.745	.4590
Quarter 2 ***	.8109	.2116	3.832	.0003	.8189	.2116	3.870	.0002
Quarter 3 ***	.8128	.1949	4.171	.0001	.8156	.1951	4.180	.0001

* PL-480 in thousands of pounds.

** Production measured in metric tons, entered in October.

*** Quarterly effects are dummy variables expressed as deviations from the 4th quarter. First quarter begins in December.

TABLE 7-15

Average Monthly Prices per 100 Weight for White Corn

<u>Year</u>	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>	<u>Annual Average</u>
1973	4.80	4.94	6.07	7.23	7.02	6.61	6.46	5.62	5.18	5.25	6.16	6.08	5.95
1974	5.98	6.01	7.07	7.97	7.09	6.60	6.41	6.19	6.43	6.23	6.40	6.74	6.69
1975	6.72	7.22	7.61	7.91	7.72	8.10	9.88	9.89	9.37	6.98	6.69	6.49	7.80
1976	6.13	6.67	6.76	6.77	6.51	6.32	6.24	5.70	5.72	5.47	5.26	6.04	6.13
1977	6.51	6.96	7.99	8.56	8.20	8.80	9.11	8.13	7.05	6.36	6.85	7.03	7.62
1978	7.10	7.28	8.49	8.98	8.61	9.38	9.24	8.36	7.98	7.26	7.45	7.15	8.10
1979	6.89	7.65	8.49	8.83	8.44	8.47	8.40	8.11					

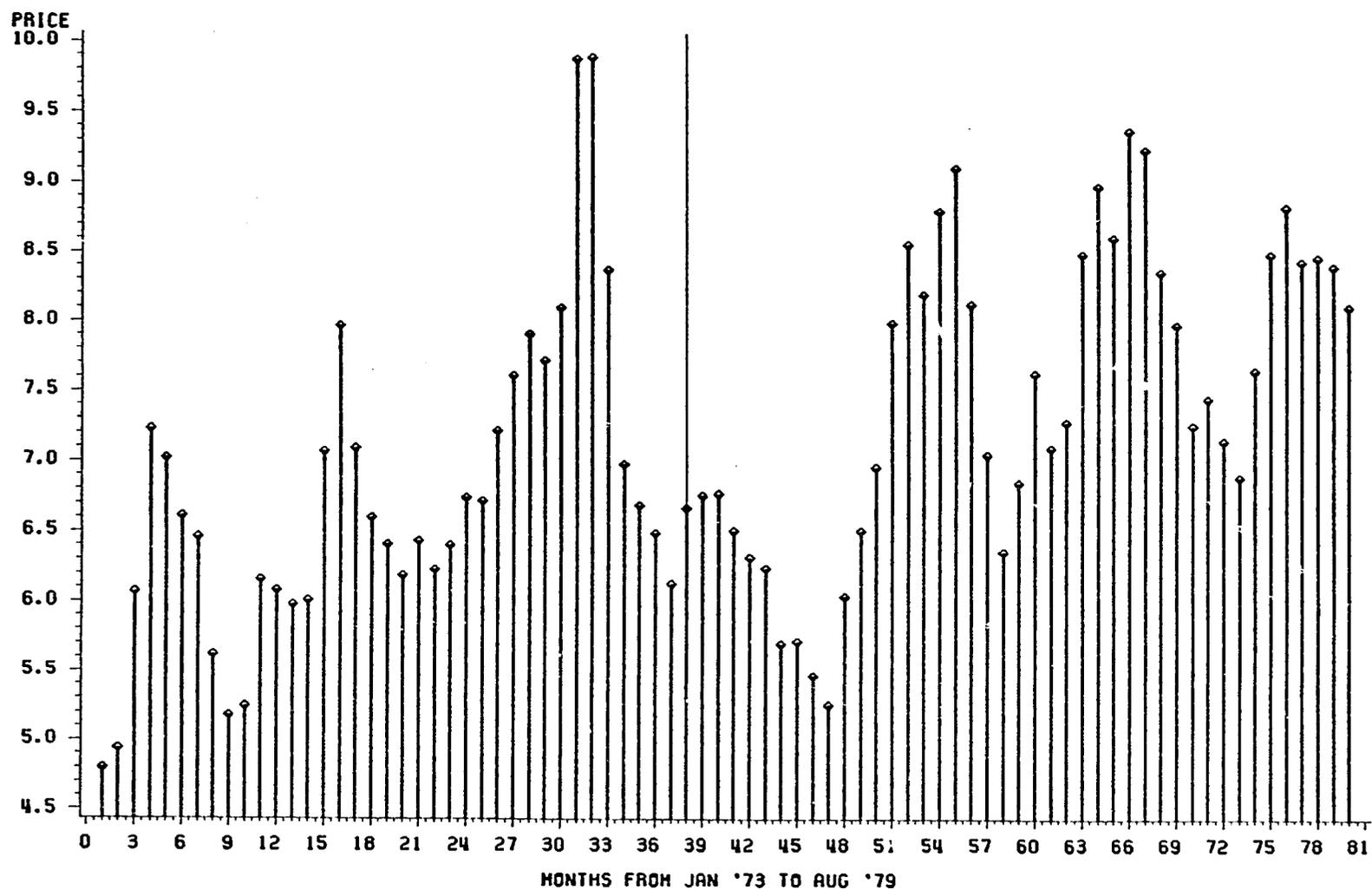
Source: Indeca.

FIGURE 7-8

WHITE CORN

MONTHLY PRICES PER HUNDRED-WEIGHT

JANUARY 1973 - AUGUST 1979



MONTH #38 IS FEB. 1976

TABLE 7-16 .

Average Monthly Prices per 100 Weight for Yellow Corn

<u>Year</u>	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>	<u>Annual Average</u>
1973	4.79	4.91	5.14	6.50	6.42	6.07	5.87	5.29	4.92	5.59	6.55	6.45	5.71
1974	6.22	5.13	6.90	7.77	7.03	6.90	6.62	6.33	6.52	6.41	6.60	6.84	6.69
1975	7.03	7.31	7.70	7.92	7.85	8.07	9.90	10.25	8.43	7.35	6.98	6.78	7.95
1976	6.57	6.73	6.78	6.82	6.72	6.75	6.51	6.00	5.93	5.61	5.46	6.14	6.34
1977	6.60	7.04	7.99	8.60	8.02	8.76	8.68	7.93	6.79	6.15	6.63	7.00	7.51
1978	7.22	7.16	7.48	8.29	8.21	8.67	8.67	8.18	7.67	7.26	7.69	7.61	7.83
1979	7.99	7.42	8.00	8.00	7.96	7.84	7.92	8.00					

Source: Indeca.

and Figure 7-9 give these figures for yellow corn. The regression equation used to establish corn price effects is as follows:

$$\begin{aligned} \text{PRICE} = & \alpha + \beta_1 (\text{Pre E.Q. trend}_t) + \beta_2 (\text{Feb. '76 - Jan. '77 trend}_t) + \beta_3 (\text{Feb.} \\ & \text{'77 - Jan. '78 trend}_t) + \beta_4 (\text{Feb. '78 - Aug. '79 trend}_t) + \\ & \beta_5 (\text{Production}_t) + \beta_6 (\text{PL-480 distribution}_t) + \beta_7 (\text{quarter 1}_t) + \\ & \beta_8 (\text{quarter 2}_t) + \beta_9 (\text{quarter 3}_t) + U_t \end{aligned}$$

From these tables, we see that the estimates for PL-480 impact are not significantly different from zero. From this analysis, we are forced to conclude that PL-480 distribution of corn had no significant effect on prices (per 100 wt.). The PL-480 distribution of corn, it should be remembered, represented a much smaller proportion of total production than did beans.

However, there could still be an impact on prices after the earthquake due to factors not explicitly included in the model. One test for these effects would be a series of "t" tests for differences in the coefficients of the time trend variables. Table 7-17 summarizes these tests.

It is evident that the rate of increase during the pre-earthquake period is significantly different from any trend in prices since. Another way of saying this is that during these post-earthquake time periods, prices showed a decrease in the rate of increase: prices did not increase as fast as they had from January 1973 through January 1976. It should be remembered that these are "averaged" estimates for twelve month periods. We can look to the actual price data (Figures 7-8 and 7-9) for a detailed accounting of price month by month.

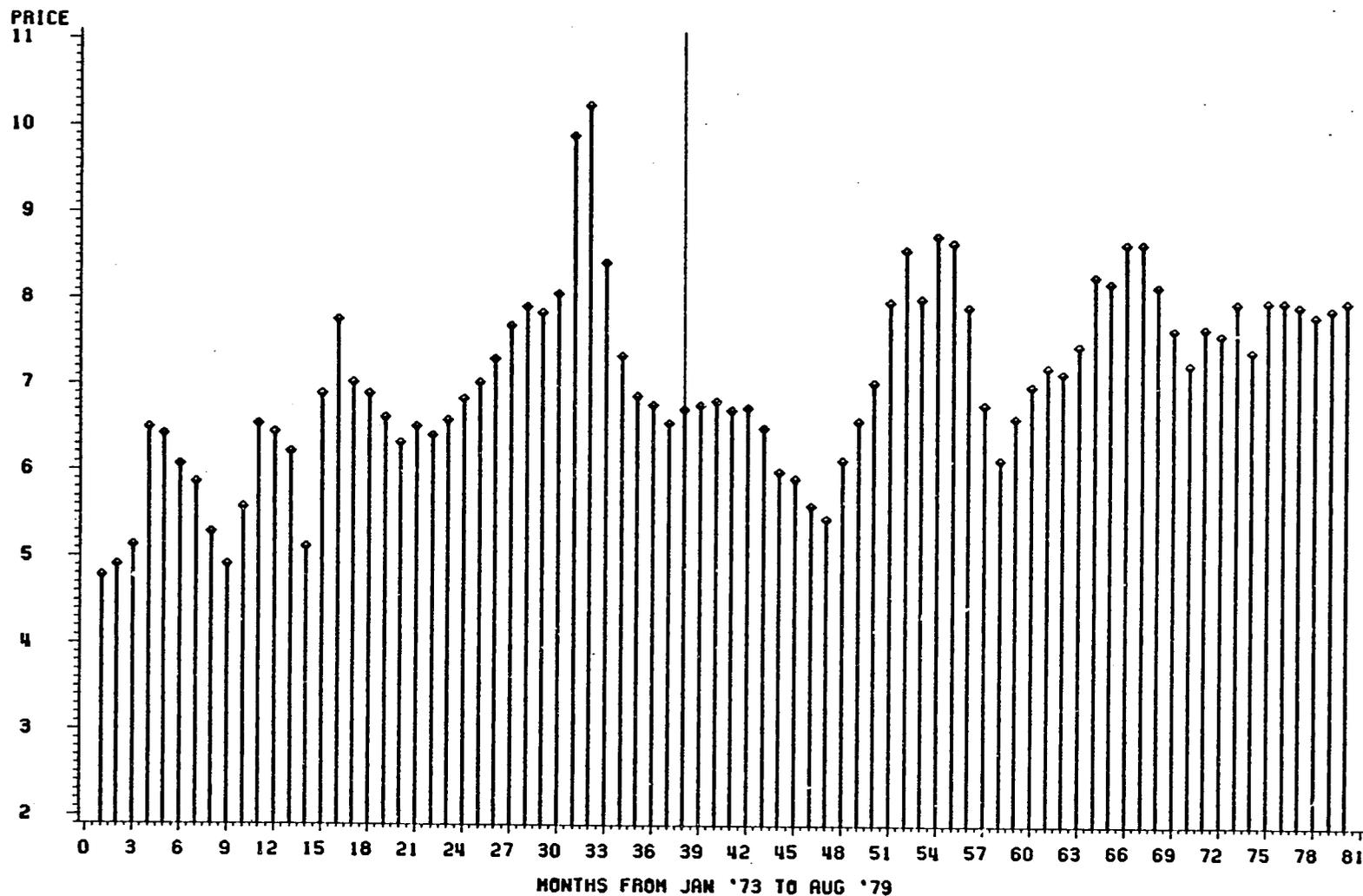
Alternative explanations for lower than expected prices during the years following the earthquake must consider the bumper harvest of 1975-1976 and record harvest since, in addition to the petroleum situation in

FIGURE 7-9

YELLOW CORN

MONTHLY PRICES PER HUNDRED-WEIGHT

JANUARY 1973 - AUGUST 1979



345

TABLE 7-17

White Corn

	<u>Jan. '73-Jan. '76</u>	<u>Feb. '76-Jan. '77</u>	<u>Feb. '77-Jan. '78</u>
Feb. '76-Jan. '77	3.654*		
Feb. '77-Jan. '78	2.387*	1.651	
Feb. '78-Aug. '79	2.576*	1.389	.459
Feb. '76-Aug. '79	2.616		

Yellow Corn

Feb. '76-Jan. '77	3.965*		
Feb. '77-Jan. '78	3.314*	.747	
Feb. '78-Aug. '79	3.690*	.101	.869
Feb. '76-Aug. '79	3.699		

*Significant at .05 level or greater

Guatemala. Lacking price data on agricultural inputs, we can not directly test their significance. But it does seem probable that production levels were primarily responsible for the lower than expected observed prices.

Figure 7-10 shows actual prices and predicted prices for white corn; Fig. 7-11 shows these figures for yellow corn. The actual price figures appear in Tables 7-15 and 7-16. Figure 7-1 shows annual production figures for 1972-1980 in metric tons.

Summary

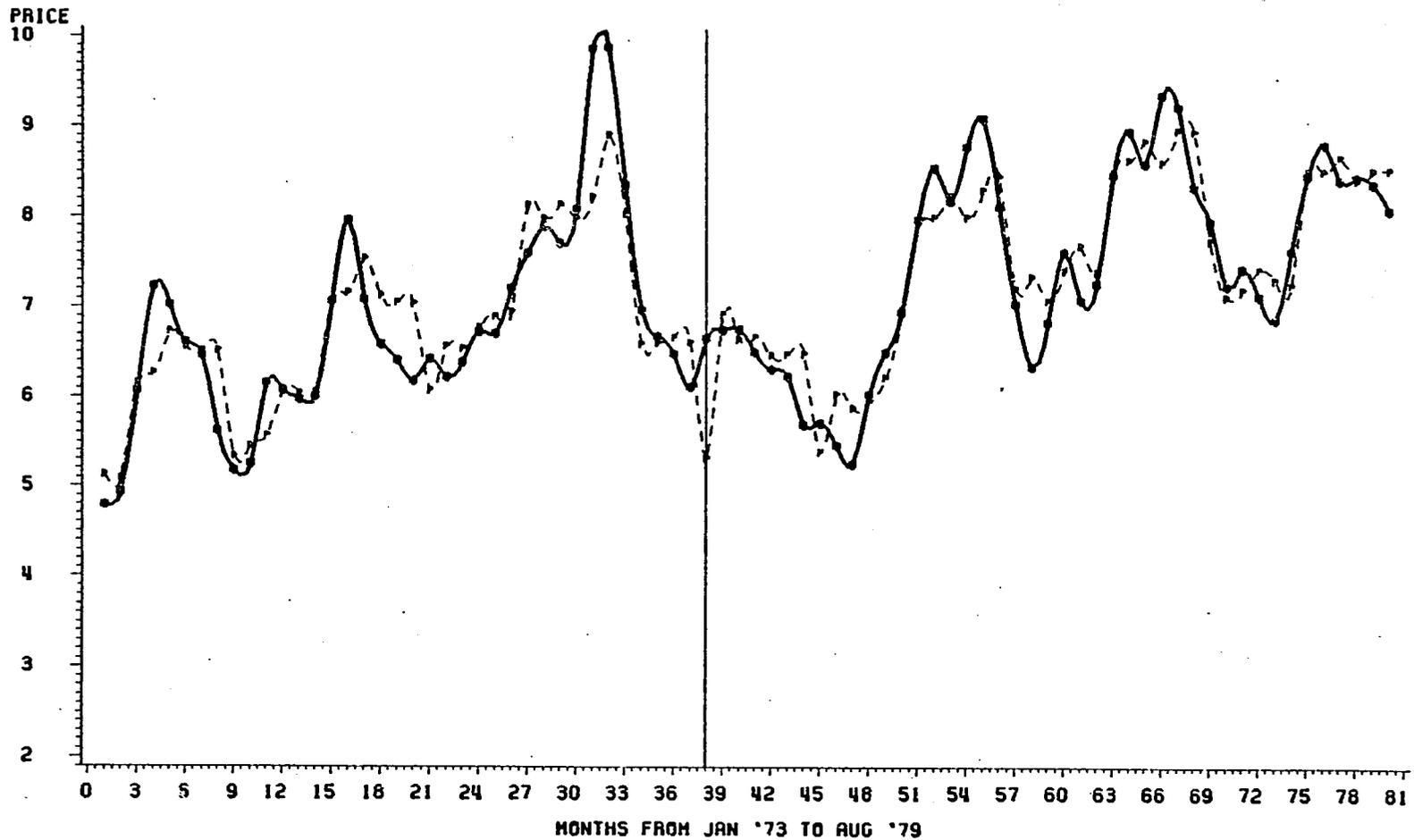
Lower than expected prices were noticed for corn and beans after the February 1976 earthquake. Some food critics pointed to PL-480 food

FIGURE 7-10

WHITE CORN

ACTUAL & PREDICTED MONTHLY PRICES

JANUARY 1973 - AUGUST 1979



HEAVY LINE IS ACTUAL PRICE
LIGHT LINE IS PREDICTED PRICE

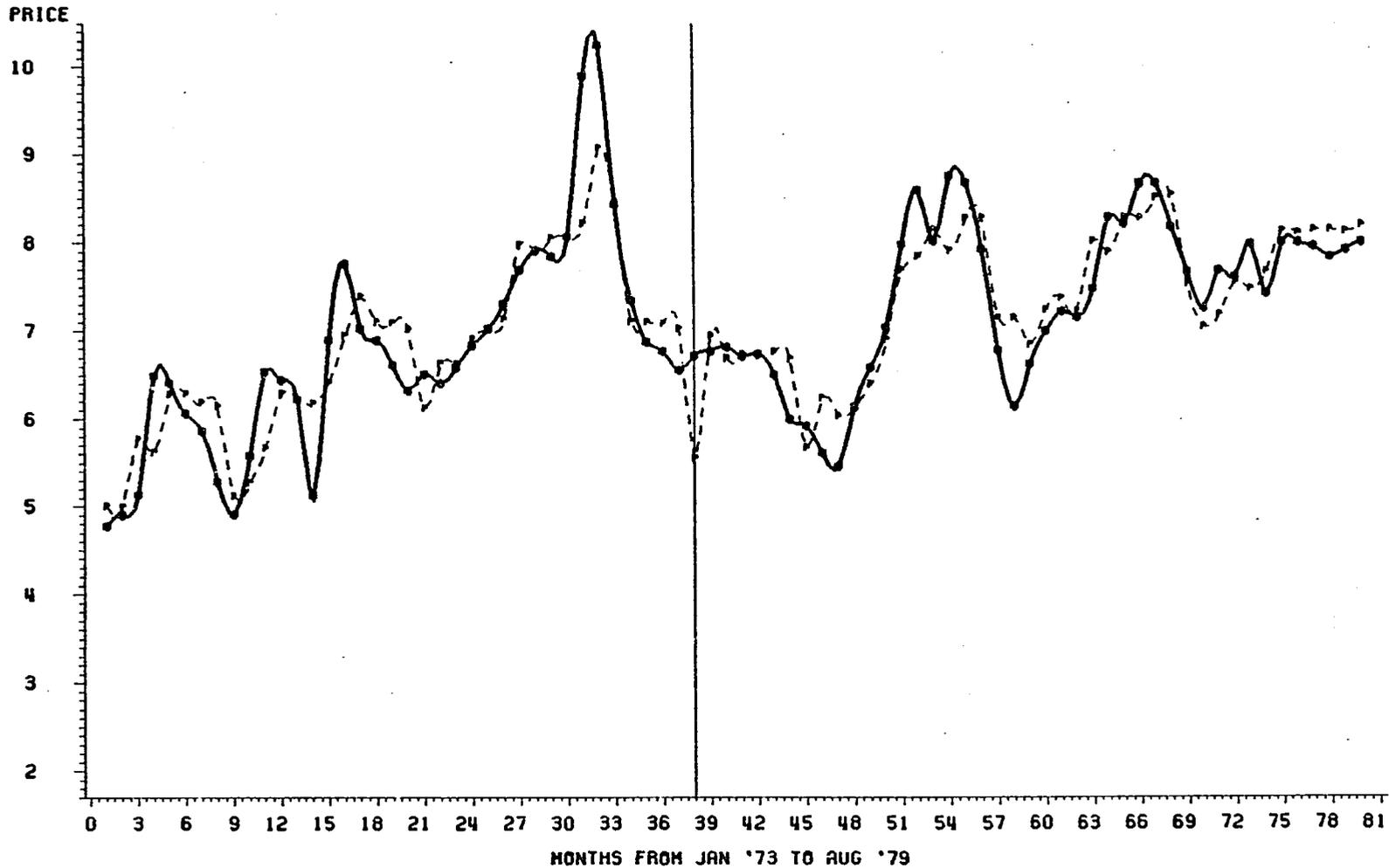
VERTICAL LINE AT
MONTH 38 = FEB. 1976

FIGURE 7-11

YELLOW CORN

ACTUAL & PREDICTED MONTHLY PRICES

JANUARY 1973 - AUGUST 1979



HEAVY LINE IS ACTUAL PRICE
LIGHT LINE IS PREDICTED PRICE

VERTICAL LINE AT
MONTH 38 = FEB. 1976

distribution as the culprit. In the case of beans, there appears to be empirical evidence that this was indeed the case. The total cost to farmers of course depends on the volume sold and the timing of this sale. Caution should be exercised in attempting to apply the statistical model to any single month but in order to attach some meaning to these figures, a "worst case" scenario based on this model may be useful.

Assuming that bean prices were affected by as much as \$2.15 per hundred weight for a particular month and that a farmer sold four hundred pounds of beans, simple multiplication tells us that this farmer lost \$8.60 due to PL-480 food distribution by selling beans that month. This scenario is for an individual farmer. For the wholesale middleman or larger scale farmer, the net loss due to PL-480 food distribution could have been multiplied several fold. Those who bought beans as the 1975-76 harvest reached market and planned to sell during the summer months when prices were highest could not do so at a profit. From the actual prices in Table 7-11 (or Fig.7-4) we can see that prices remained at or below the January 1976 price until May 1977. By July, prices reached \$20.95 per one hundred weight and by November of that year, \$31.52 per one hundred weight. These conclusions partially support the contention of food program critics that PL-480 food distribution negatively affected prices, at least for beans during the first year following the earthquake.

In the case of corn, food critics' claims that PL-480 food distribution affected prices could not be supported with our data. Undoubtedly, prices were not as high during 1976 as they had been in 1975 or were in 1977. But the bumper harvest of 1975-76 appears to have been the main cause of this deflation in price. No significant covariation in price and PL-480

distribution levels could be found, once production levels, on-going linear trends in prices, and normal quarterly variations were statistically removed. This, in spite of trying different lag periods for PL-480, interaction effects and different data sources for production. We must, however, remind the reader that in certain isolated local markets PL-480 corn distribution may have significantly depressed prices. Nevertheless, with respect to average prices for major regional markets, no significant effect could be found for corn prices.

It should be remembered that we have dealt with prices for large quantities (hundred weight units). These prices represent what farmers received for their crops and are the appropriate prices to examine in attempting to address the concerns of PL-480 food critics. Though we expect that prices for small quantities (pounds) roughly parallel the prices per hundred weight, it should not be assumed that they also indicate what the consumer paid.