

SOCIAL ECONOMIC AND INSTITUTIONAL VULNERABILITIES AND THE LIMON EARTHQUAKE DISASTER IN COSTA RICA. <sup>(1)</sup>

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1. INTRODUCTION:

Late in the afternoon, on the 22nd of April 1991, the Atlantic Coast and adjacent highland regions of Costa Rica were abruptly shaken by an intense earthquake measuring 7.4 on the Richter Scale and with a maximum impact of IX on the modified Mercalli scale. The quake, with its registered epicentre located in the Telire River area of the Talamanca mountains surprised both the national scientific community and the regional population affected by the large scale earth movement it produced.

The Atlantic Coast had been erroneously considered by many to be a seismic haven, as compared to the Central Valley and Pacific regions of this small Central American country (52000 sq.Km). The strongest and most damaging quake of this century abruptly changed prevailing attitudes, led to the need for a new evaluation of seismic patterns in the country and dealt a vivid reminder of the need to maintain the historical record permanently present in the collective memory. The Atlantic Coast, as would later be recalled had, in fact, suffered various 7.0 + quakes during the last few centuries, including two during the present one (1798, 1822, 1910, and 1916).

The earth movement and the disaster it helped produce seriously affected an area of some 13000 square Km, which has traditionally and recurrently been affected by flooding of the numerous rivers which cross the coastal plain (Sixaola, Estrella, Banano, Bananita, Pacuare, Reventazon etc.). Characterized by generally low levels of population density, with the exception of the cities of Limon and Turrialba, and amongst the highest levels of poverty and social deprivation in the country, the area has traditionally been considered an "abandoned region".

High levels of unemployment and low labour participation rates related to a depressed urban economy and a low productivity, small scale subsistence or semicommercial rural

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sector, prevail in the Atlantic region. This contrasts markedly with a dynamic and lucrative banana plantation enclave, located principally in the valleys of the rivers Estrella and Sixaola, and important urban based industrial and service activities related to the country's only petroleum refining plant (RECOPE) and major import-export facility (Limon-Moin). Tourism in the coastal resorts of Cahuita, Puerto Viejo and Punta Uvita represent a potential major growth industry.

For many, the quake constituted a somewhat more violent and abrupt manifestation of the conditions of permanent social disaster experienced in the region for decades. Beyond the severe short and medium term problems suffered by the population following the quake, and the measures taken to ameliorate its impact, the disaster served, in itself, to mobilize a series of social forces around the idea of the historical abandonment of the impacted region leading to increasing demands for priority attention to be given to the broad social and developmental problems which severely affect many of Limon provinces 200,000 population and the population of adjacent areas of Turrialba (Cartago Province).

In this chapter we will attempt to highlight some of the more relevant social aspects of the earthquake (organizational, political, economic and developmental), relating them to the preexisting social matrix, utilizing a method which approximates the prevailing idea of vulnerability analysis.

In dealing with a relatively wide range of broadly interpreted social variables our concern is not only to present a reasonably substantiated empirical analysis but also to provide a suggestive framework which, perhaps, leaves more questions unanswered than resolved. The limited documental information available and the lack of indepth research on the social aspects of the earthquake are overriding factors which preclude any definitive attempt to establish the exact nature of the social conditioning and impact of the quake. But, undoubtedly sufficient to provide a scenario of real or potential concerns, and a basis for a future research agenda.

In elaborating our analysis we have rested heavily on newspaper reports, official government documents and personal communication with on the scene actors.

When quoting newspaper articles, we use the following abbreviations: L.N - La Nación; L.R. - La República; P.L. - La Prensa Libre; D.E. - Diario Extra and T.T. - Tico Times. In all cases, unless otherwise stated, the year of publication is 1991. Newspaper articles have not been included in the end of chapter bibliography.

The chapter includes four major sections. The first provides

a very brief summary of the conceptual aspects relating to a social science perspective on disasters. In our second section, we provide a discursive vision of the impact of the earthquake in human, infrastructural and developmental terms. In addition, we consider certain problems related to the reconstruction effort during the months following the quake, and to the prevailing social-political context. The third section concentrates on the problem of emergency organization, analysing the principle problems faced and the solutions sought in terms of new institutional arrangements.

The fourth and final section concentrates on a number of residual but important themes primarily relating to the broad area of information diffusion. A series of concluding remarks close the chapter.

## 2. The Concept of Disaster in the Social Sciences:

Whilst no completely satisfactory and comprehensive definition of "disaster" has emerged from the social science discussion on the theme, that elaborated by Kreps (1984, p.312), building on Charles Fritz's classical sociological definition (Fritz, 1961, p.655), is insufficiently explicit for our purposes. Thus, Kreps defines a disaster in terms of:

"events, observable in time and space, in which societies or their larger subunits (e.g. communities, regions) incur physical damages and losses or disruption of their routine functioning. Both the causes and consequences of these events are related to the social structures and processes of their subunits".

Based on this definition, we would concur with Quarantelli (1987, p.23) as regards the need to refer to "occasions" rather than "events", thus introducing the possibility of viewing disasters as "opportunities" and not simply as "outcomes". Moreover, such a categorization also permits a vision of disasters in terms of social change and not merely as a social problem. A "social change context" not only allows for positive consequences, but more important sets disasters within the social dynamics of social life, an integral part of what usually goes on in the social structure rather than as an external intrusion from the outside" (Quarantelli, 1987, p.23).

The insistence on the social nature of disasters automatically precludes the idea that these can be unilaterally explained or defined in terms of the presence or impact of a determined physical agent (earthquake, hurricane, volcanic eruption etc.) Although a "natural

disaster" inevitably requires the presence of a physical triggering mechanism, the disaster occasion occurs as the result of a physical event impinging on a socially vulnerable territory. Such vulnerability constitutes a preexisting condition in the affected area, whether it be related to the inadequate location of housing or economic infrastructure, inefficient construction techniques, poverty and malnutrition, inadequate levels of social organization etc.

Seen from this perspective, a disaster is anything but an "abnormal" occurrence and should rather be considered as a particular state of normality, as a temporal expression of the normal, prevailing social conditions operating under extreme circumstances. Pelanda (1981, p.1) captures the essence of this idea when he states that

"if one seeks an understanding of what happens at the interface between extreme physical phenomena and the social system, it is necessary to look at the relationship between the context of 'normality' and the process of disaster".

### 3. The Human, Infrastructural and Economic Impact of the Limon Earthquake.

#### 3-1 Deaths, Injuries and Affected Population.

The number of fatalities occurring during major earthquakes in developing countries has consistently been a matter of controversy or speculation, often pitting official government data against the estimates or calculations of independent nongovernmental organizations or individuals. Such was the case, for example, during the Mexico City earthquake in 1985, where few independent observers put much credence on the near to 5000 deaths recorded officially, whilst the same situation existed in Guatemala in 1976, where the 25000 fatalities officially recorded was widely considered to be a gross underestimation.

In the case of the Limon quake, irrespective of the exact figures, the death and injury toll was exceedingly low if we consider both the intensity of the tremor and the levels of infrastructural and natural or ecological disruption suffered (widescale deforestation and landsliding in river basins, and uplifting of the coastal plain by up to a metre and half near to Limon City).

Official figures, put out by the country's National Emergency Commission (NEC) (see Mendez Antillon, 1991) refer to 48 fatalities, all in Limon Province, and 585 injuries, of which all but seven occurred in the Atlantic Coastal Province. However, the range of published data oscillated between 27, as recorded by the Judicial Police and 56, as registered by the National Red Cross. This latter organization had, at one time, announced 62 deaths. (see T.May 3rd), whilst, to further confuse the panorama and the public, the country's principle "prestige" newspaper, La Nacion, reported 54 deaths in its October 23 edition, six months after the quake.

Such a wide range of conflicting numbers led the English speaking weekly, the Tico Times, to publish a picaresque article in its May 24 edition titled "How many died in quake?. Depends who you ask". Their conclusion, after interviewing different organizational representatives, was that the NEC figures were an "average" of the Judicial Police and Red Cross data. The former was compiled according to local mayors reports, and the latter based on onsite observations during search and rescue operatives. Faced with the discrepancies, the Tico Times somewhat irreverently suggested that "perhaps we should not cavalierly dismiss the possibility of resurrection".

Due to the relatively low level of fatalities, whichever data set you accept, the problem does not appear to be overly serious. However, in themselves such discrepancies illustrate the problems of evaluating impacts where no standardized procedures exist and official responsibility for data production and diffusion is divided between different established and legitimate authorities. Moreover, the uncertainty can only confuse the mass media and the public and open the door to the use of more sensationalist information. Observers from outside of Costa Rica in fact reported hearing news items referring to fatalities in the hundreds or even thousands, including references to wide scale damage in the San Jose Metropolitan Area. Although a difference of 100% between the lowest and highest figures is not very significant when dealing with such reduced numbers, this would obviously not be the case were the fatalities in the thousands or tens of thousands.

The limited impact of the quake in terms of the numbers of fatalities and injuries can undoubtedly be explained principally in terms of the prevailing characteristics of the housing infrastructure in the region and, to a lesser extent to the relatively small population and low demographic densities of the region. Very few buildings in

or outside of Limon City, the major population concentration (70000), exceed two stories in height, whereas a large number of housing units have wood frame structures, many very flimsily put together. The relative lack of concrete frame or adobe structures undoubtedly ameliorated the human impact of the tremor. Even in Limon City, where many public and private buildings suffered superficial or structural damage, the only case of a major building falling was that of the centrally located Hotel International, which was unoccupied at the time and in which only one person died.

The low level of deaths and injuries, contrasts markedly with the widescale destruction or damage to housing units as can be rapidly appreciated considering data produced by the country's Special Housing Commission. (Comisión Especial de Vivienda, Dirección de Planeación y Control. 1991).

In Limon Province, 3924 houses were declared destroyed or uninhabitable and a further 3638 suffered severe damages. For the Turrialba area of neighbouring Cartago Province, the comparable figures were 408 and 938. Falling roofs and walls accounted for an important number of the deaths and the information provided for the 27 deaths registered by the Judicial Police show that 70% of the deaths occurred to persons over the age of 60 or under 12 years old. The territorial distribution of fatalities is somewhat unclear with conflicting data published in the local press. Thus, for example, whilst Red Cross data published in the April 24 edition of "Diario La Extra", for 47 cases, refers to 13 in Limon City, 3 in Bataan, 1 in Bribri, 9 in Sixaola, 3 in the RECOPE refinery, 7 in 28 Millas and 7 in Valle de la Estrella; "La Nación" informed in its May 1 edition, of 9 in Limon, 20 in Matina and 18 in Talamanca.

The confusion prevalent in much of the statistical data which circulated in the aftermath of the quake, is particularly notorious when one attempts to reach conclusions as regards the overall numbers of "affected persons". In Spanish, it is common place to use the term "damnificado", but this term clearly had no preestablished and consistent conceptual and definitory basis as used by national authorities and reproduced in the local press. The extremes in this situation were established by the NEC which at one point (see Mendez Antillon, 1991) spoke of 6841 affected persons or "damnificados", and the Minister of the Presidency, Rodolfo Mendez Mata, who was reported in "La Nacion" (April 27, p.4a) to have referred to "55000 affected (damnificados) families". In between, the press at different times reported 7, 10, 15 and 55000 damnificados.

What is clearly at stake here is the obviously varied use given to the term. Confusion between such more precise concepts as "homeless persons", "temporarily homeless", "people in need of short term food supplies" or "unemployed persons due to the destruction of production facilities" etc., probably explain some of the discrepancies. But, in the case of the data which circulated around the Limon case other serious problems of consistency can be detected. Thus, the data attributed to Mendez Mata, 55000 families, translated into numbers of individuals, would put the figure well above 200000, i.e. the total population of the affected area! Whilst, on the other hand, the data published by the NEC, 6841 persons, is, whatever the parameter used, totally contradictory with the data published in the same reference document which refers to 5087 destroyed houses. Such a number of destitute families would undoubtedly push the number of homeless and needy persons up above the 20000 mark, taking a conservative average of four persons per dwelling.

Overall, in examining the range of data which circulated in the aftermath of the quake one inevitably conjures up the oft quoted phrase which refers to the existence of "lies, damned lies and statistics".

### 3.2 Infrastructural and Production Losses.

The limited loss of human life caused by the Limon earthquake stands in stark contrast to relatively large scale losses in infrastructure and economic production.

As regards the direct losses in structures and short term economic production, the most systematic information has been provided in a document elaborated by Vanesa Robles for the Directorate for Prevention and Mitigation of the National Emergency Commission, based on information gathered from different government ministries and decentralized agencies, following their indepth analysis and calculations of losses. (Comisión Nacional de Emergencias, Dirección de Prevención y Mitigación (Robles, V.), 1991)

In table 1, we have summarized the principle information appearing in this document. No attempt is made here to provide precise details as to the infrastructural facilities destroyed, or as regards the particular characteristics of the quake which led to the losses (physical characteristics of the earth movement, liquefaction, earth uplifting etc.). An excellent early

TABLE #1

## ECONOMIC LOSSES IN INFRASTRUCTURE AND AGRICULTURAL PRODUCTION

SECTOR	PRINCIPLE DAMAGES OR LOSSES	ECONOMIC COST (IN MILLION OF COLONES)
1. Rural Aqueducts	Tubes, storage tanks, pumps, collection tanks wells and connections in homes	2.700
2. RECOPE Petroleum Refinery	storage tanks, tubing, pumping system, processing area, piping, raw materials	8.000
3. Telecommunications	Network and buildings	44.3
4. Electricity	Network and buildings	79.6
5. Foreign Trade	Quays, customs buildings and industrial equipment	24.7
6. Agriculture	Banana Production (including infrastructure) Bananas ready for export Small Scale agricultural production	3523.6 3428.7 30.0
7. Education	Damage (41) or demolished (4) schools University of Costa Rica	125.0 100.0
8. Road Network and transport infrastructure	National high ways (including bridges) secondary highways municipal rural roads Airport Port infrastructure	938.0 153.0 336.2 20.6 1722.0
9. Health	Health Centres, Rural health centres, asyloms and child centres clinics and hospitals	44.2 500.0
10. Railways	Track (114 Km) Bridges (4) Repair house (Limon) Buildings and maintenance equipment	531.1 106.6 325.0 130.0
11. Housing		5600.0

TOTAL

\* 28618.0 COLONES

SOURCE: Comision Nacional de Emergencias, Direccion de Prevencion y Mitigacion. 1991.



review of these aspects can be found in EQE International's "Quick Look Report" published in May 1991, very shortly after the quake.

According to the Robles report, total losses in infrastructure and agricultural production up to August 1991 were estimated at nearly 29 billion colones which in dollars terms signifies 205 millions at the present day exchange rate (March 1992) and some 224 millions taking the exchange rate in August 1991. Of this sum, around 7 billion colones was attributed to losses in agricultural production or exports, particularly large scale banana production.

In economic terms the principle losses were registered in the RECOPE petroleum refinery, in housing, transport systems (highways, bridges, railways, and ports) and in rural water distribution systems.

The damage to major sections of the San José-Siquirres-Limon and Limon-Sixola highways (including the destruction of eight major bridges), as well as wide scale damage to secondary and rural road systems was to have a major impact on relief efforts to communities outside of Limon, and in terms of lost agricultural exports and sales. This, and damage to nearly 90% of the water distribution systems, including the total incapacitation of La Bomba System which supplied nearly 70% of Limon City's water supply, was to cause the major problems for the local population in the immediate aftermath of the quake, and for months afterwards. The lack of access to potable water raised increased fears as regards the possible propagation of a Cholera epidemic, particularly in Limon City.

The impact on housing was widescale posing a serious social and economic problem for government authorities. Data on the extent and spatial distribution of damage to housing was systematized by the government's Special Housing Commission and published in a document completed in September 1991. Table 2 reproduces the relevant information from this study, for the provinces of Limon and Cartago. (Comision Especial de Vivienda op. cit.)

Although the city of Limon (Limon Center, Colina, Pueblo Nuevo, Cristobal Colon) suffered the greatest absolute levels of damage, particularly amongst the poorer sectors, relative levels of damage were greater in such communities as Matina, Bataan, Bomba, La Suiza and Sixola, widely dispersed over the affected area.

An examination of the information produced by the Housing Commission leaves two major unresolved questions.

TABLE #2

## DAMAGE TO HOUSING DURING THE APRIL 22ND LIMON EARTHQUAKE

PROVINCE AND LOCALITY	DESTROYED/ UNINHABITABLE	SEVERELY DAMAGED	LIGHT DAMAGE	TOTAL
1. LIMON				
BARRAS	53	14	0	67
BATAAN	303	242	158	703
BOMBA	356	309	124	789
CAHUITA	189	106	23	318
COLINA (LIMON)	350	386	445	1,181
CORALES	38	86	161	285
CRISTOBAL COLON	357	379	313	1,049
LIMON CENTRE	678	905	728	2,311
LIVERPOOL	95	114	89	298
MATINA	741	271	142	1,154
MOIN	181	154	147	482
PUEBLO NUEVO	172	110	118	400
SIQUIRRES	41	109	67	197
SIYAOLA / TALAMANCA	351	426	94	871
UNSPECIFIED	19	27	11	57
TOTAL	3,924	3,638	2,600	10,163
2. CARTAGO				
TURRIALBA CENTER	73	257	175	505
SUIZA	173	247	98	523
SANTA CRUZ	32	68	45	145
TUIS	41	74	40	155
TAYUTIE	31	120	63	194
PAVONES	22	49	19	90
JESUS MARIA	6	39	17	62
OTHER LOCALITIES	35	84	64	173
TOTALS	408	938	501	1,847

SOURCE: Special Housing Commission, Directorate of Planning and Control. September 1991.

Thus, although the Commission records 4332 cases of destroyed dwellings, it only registers 3153 cases of families which were in need of relocation ("reubicacion"). And, secondly, it is interesting to note that in a subsequent table of the document, dealing with the investment required for reconstruction, the distribution of housing according to the three categories established (destroyed, severely damaged and lightly damaged), is different to that produced in earlier tables, as can be seen in the summary information reproduced from the table below:

	LIMON.		TURRIALBA.	
	OWNER	OCC. RENTED	OWNER	OCC. RENTED
DESTROYED	2733	-	328	-
SEVERLY DAMAGED	2554	2827	767	326
LIGHT DAMAGE	2048	-	426	-
TOTAL	7335	2827	1521	326

This change in distribution is not explained in the document. Here it is also interesting to note (and not at all clear why), that no rented housing either in Turrialba or in Limon was classified as "destroyed".

This apparent inconsistency in the information takes us back to a recurring theme in this chapter. Thus, the wide range of differing data attributed to national authorities, and reported in the press during the immediate aftermath of the quake or during the following seven months, could only confuse the public and discerning analysts of the problematic.

In table 3, we have summarized the range of estimates relating to global and sectorial damages and losses, as reproduced in the national press between the 24th of April and October 24, 1991. The table includes information on the newspaper edition, the quoted source of the information, the economic sectors to which the information refers and the estimated or calculated costs (at times, in colones and at others in US dollars).

A quick revision of Table 3 is sufficient to gain a rapid appreciation of the varying range of figures emitted. Two major comments can be made of an analytical or qualitative nature, as regards this information.

Firstly, the vast differences which exist between estimates given in the first days following the quake and between these and those given in later months requires a

TABLE #3  
LOSSES IN INFRASTRUCTURE AND PRODUCTION  
REPORTED IN THE NATIONAL PRESS  
APRIL-OCTOBER 1991

SOURCE	OFFICIAL SOURCE QUOTED	UNITS OR ITEMS REPORTED	COST QUOTED (IN MILLIONS)
DIARIO EXTRA 24th APRIL P. 4	ROBERTO ROJAS (MIN. OF FOREIGN TRADE)	LOSSES IN BANANA PRODUCTION ESTRELLA VALLEY.	\$595
LA NACION 24th APRIL P. 13A	RENATO SUDARASSI (MIN. OF PUBLIC WORKS)	DAMAGES TO ROADS AND BRIDGES	\$1.700
	HERNAN BRAVO (MIN. OF ENERGY, MINES AND NATURAL RESOURCES)	DAMAGE RECOPE REFI- NERY	\$200
DIARIO EXTRA 25th APRIL P. 5	MINISTRY OF PUBLIC WORKS	PRELIMINARY ESTIMA- MATES DAMAGES ROADS BRIDGES AND OTHER SECTORS	\$2.000
DIARIO EXTRA 25th APRIL; LA NACION 25th APRIL P. 11A; LA REPUBLICA 25th APRIL P. 12A	CARLOS ALVARADO EXEC. PRES. JAPDEVA	REPAIRS TO PORTS, LIMON AND MOIN	\$500
LA NACION, 25th APRIL, P. 4A	NOT QUOTED	DAMAGE TO ACUEDUCTS DAMAGE TO TONY FACIO HOSPITAL	\$500 \$300
LA NACION 25th APRIL, P. 12A LA REPUBLICA 25th APRIL, P. 11A.	MARIANO GUARDIA (VICEMINISTER, PUBLIC WORKS AND TRANSPORT)	REPAIRS TO ROADS	\$2.000
LA PRENSA LIBRE 25th APRIL, P. 3	'ACCORDING TO AN OFFICIAL REPORT' (NOT SPECIFIED)	TOTAL LOSSES	U.S. \$600

LA REPUBLICA, 26th APRIL, P. 2A	THELMO VARGAS (MINISTER OF FINANCES)	PRELIMINARY ESTIMATES TOTAL COST OF REPAIRS	±7.000
		DAMAGES TO ROADS AND BRIDGES	±2.500
		DAMAGE TO AQUEDUCTS	± 500
		DAMAGE TO QUAYS AND RAILWAYS	± 600
LA NACION 26th APRIL, P. 10A.	GUILLERMO RUIZ (EXECUTIVE PRESIDENT INCOFER) (RAILWAY COMPANY)	REPAIRS TO RAILWAYS SIQUIRRES-LIMON	NOT LESS THAN ±50
LA NACION 26th APRIL P. 4A	THELMO VARGAS (MINISTER OF FINANCES)	TOTAL DAMAGES	±6-7.000
DIARIO EXTRA 27th APRIL.	THELMO VARGAS (MINISTER OF FINANCES)	TOTAL DAMAGES	U.S. \$70
LA REPUBLICA 28th APRIL P. 10A	JAPDEVA	REPAIRS TO QUAYS IN LIMON PORT AREA	±500
LA REPUBLICA MAY 1ST P. 4A	"THE GOVERNMENT"	REPAIRS TO SCHOOLS	±300-350
LA NACION MAY 3rd, P. 4A.	GUILLERMO MADRIZ (MIN. OF PUBLIC WORKS AND TRANSPORT)	DAMAGE TO INFRAS- STRUCTURE PRINCIPALLY ROADS AND PORTS	±3.600
		DAMAGE TO ROADS AND BRIDGES	±2.400
		DAGGING OF PORTS	±480
LA REPUBLICA MAY 8th, P. 6A	CRISTOBAL ZAMADASKI (MINISTER OF HOUSING)	RECONSTRUCTION OR REPAIR TO ESTIMATED 9.000 AFFECTED HOUSES	±3.000
LA PRENSA LIBRE MAY 22nd.	BERNARDO MENDEZ (EXECUTIVE DIRECTOR NATIONAL EMERGENCY COMMISSION)	DAMAGE TO ROADS, AQUEDUCTS DRAINAGE, HOUSING, BUILDINGS AND RAILWAYS.	±13.000
LA REPUBLICA MAY 23rd P. 4A	RODOLFO MENDEZ MATA (MINISTER OF THE PRESIDENCY)	OVERALL LOSSES	±50.000
LA REPUBLICA MAY 23rd. P. 4A.	GUILLERMO MADRIZ (MIN. OF PUBLIC WORKS AND TRANSPORTS)	LOSSES IN INFRAS- STRUCTURE	±7.000

LA REPUBLICA MAY 23rd, P 4A	JUAN RAFAEL LIZANO (MINISTER OF AGRICULTURE)	LOSSES IN INFRA- STRUCTURE AND TAXES ON BANANAL	US. \$17.072
LA NACION MAY 23rd P.5A	NOT QUOTED	LOSSES IN BANANA PLANTATIONS	U.S. \$40
	NOT QUOTED	DAMAGES TO BRIDGES	\$3.000
LA REPUBLICA AUGUST 17th, P 4A	"GOVERNMENT'S EVALUATION TEAMS" AS ANNOUNCED BY GOVERNING COUNCIL	ACCUMULATED LOSSES DUE TO EARTHQUAKE AND AUGUST FLOODING	\$7.000
LA NACION AUGUST 26th, P 5A.	NOT QUOTED	ACCUMULATED LOSSES FROM ALL DISASTERS IN LAST TWO YEARS (LIMON. EARTHQUAKE AND FLOODING, ALAJUELA, PURISCAL AND COBANO EARTHQUAKE, ETC).	\$40.000
LA REPUBLICA SEPTEMBER 27th, P.2A.	WORLD BANK REPORT	REPAIRS TO DAMAGES IN INFRASTRUCTURE DURING EARTHQUAKE AND AUGUST FLOODS.	\$20.000
LA NACION OCTOBER 23rd	NOT QUOTED	TOTAL LOSSES FROM EARTHQUAKE	\$40.000

serious examination of the pertinence or convenience of emitting "rapid evaluation" data, and as regards the methodologies and concepts employed. Moreover, there is a clear need for establishing a centralized, official approach to information diffusion, and not the "free for all" approach adopted.

As regards the first point, it is difficult to understand, for example, such discrepant calculations as those on damages to the RECOPE refinery attributed to Hernan Bravo on the 24th of April (200 million colones)<sup>(2)</sup> and that registered in Vanesa Robles document of August (8 billion colones); or, those on damages to water distribution systems attributed to Thelmo Vargas on April 26, (500 million colones) and the 2.7 billion colones recorded in the Robles document, to mention but two of the more notorious cases.

In terms of this need for establishing centralized channels for the diffusion of consistent information, it is also difficult to understand for instance how Thelmo Vargas could produce a figure of 7 billion colones for estimated total costs of repairs (to infrastructure) on April 26; Bernardo Mendez Antillon, one of 13 billion colones on May 22; and, one day later, Guillermo Madriz is quoted as talking of 7 billion colones, and Rodolfo Mendez Mata, General Coordinator of the relief effort, talking of 50 billion colones!. Either the government ministers were talking about different things or the press was not quoting fully and accurately what was being said. Whichever be the case there is a clear need for changes in method in future emergency situations.

Secondly, in considering the range of estimates emitted both early on and months afterwards, the only really consistent data is that contained in the Robles document put together for the National Emergency Commission. The global information on infrastructural costs included in the document is fairly coincident with World Bank information quoted on the September 27 edition of La Republica. Thus, both calculations are near to the 20 billion colones mark. The Robles report includes a further 7 billion colones in estimated agricultural production losses.

The confusion as regards total real, short and medium term direct losses attributable to the earthquake, was further increased when Limon Province and the Turrialba area suffered disastrous flooding during the second week of

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<sup>2</sup> The colon US dollar exchange rate stood at an average of 118 in April; 128 in August; and 132 in October 1991.

August. The floods, accentuated by the devastating effect of the earthquake on upper river basins (deforestation, landslides and damming of river channels) led to important losses in agricultural production and housing units. And, at the same time, had a negative impact on many of the repairs made to roads, bridges, and water systems following the quake.

On this occasion, La Nacion reported in its August 14 edition (p.2a) that preliminary estimates of the Governing Council indicated that the losses due to flooding "may be greater than those caused by the earthquake". Given this, it came as a surprise when, on August 17, La Republica (p.4a) reported that government evaluation team estimates put the accumulated losses due to the quake and flooding at a mere 7 billion colones, whilst La Nacion, that very same day, published an article which put the estimated losses in agriculture, roads and bridges, due to the flooding, at 2.1 billion colones. Thus, if the three estimates were correct the earthquake could only have caused less than 3500 million colones in losses!

One way or another, a summary document elaborated for the National Emergency Commission following the flooding, put the preliminary estimates of losses in rural infrastructure and production at 4.3 billion colones (Comission Nacional de Emergencia 1991). With these official estimates in hand the only thing apparently really clear was that the damage caused was not greater than that related to the earthquake. But there again maybe it was!

### 3.3 Economic Impact and the Reconstruction Effort.

The data available to date refers principally to infrastructural replacement costs and to immediate direct losses in agricultural and industrial production. As regards this, Bernardo Mendez, Executive Director of the NEC, in a summary English version document put out by the Commission, pointed out verbatim that:

"The cost of repairment of US \$200 millions, that is to bring back to the existing conditions prior to the earthquake, represents close to 17% of the ordinary budget of the Central Government for 1991. It also represents about 4% of the Gross National Product (based on 1990 figures). Counting all the natural disasters which have been experienced in Costa Rica over one year, the added loss amounts to approximately 6% of the 1990 G.N.P.. For a developing country, with limited or scarce resources,



this represents a major drawback or impact to the national economy".

The 200 million dollars to which Mendez Antillon refers (which is consistent with the Robles document's estimates) only includes infrastructural replacement costs and does not take into account "agricultural, commercial, and industrial losses both on individuals and corporations" (Mendez, op. cit).

Short term direct losses in agriculture (upto August 1991) were estimated at around 7 billion colones in the Robles document. But, no calculations are known to the author on short or medium term industrial, commercial and service sector losses, such that an overall calculation of the quake's impact on the national and regional economy is impossible without future research on the topic. Despite this fact, certain aspects are clear as regards the more socially affected or vulnerable sectors.

In the first place, the dominant sectors of small scale subsistence and semicommercial agricultural population clearly suffered severe immediate short term losses and, due to their very limited financial base, enormous problems in reestablishing their production capacity. The indigenous population of the Talamanca Mountains and valleys, relatively isolated for months due to destruction of land transportation routes, were particularly hard hit given their economic dependence on small scale commercial banana production and the difficulties faced in getting it to distant markets.

Banana production, with an estimated value of 18 million colones per month was basically lost for various months following the quake, thus seriously affecting the monetary economy of many families. This factor, accompanied by the historical erosion of the local selfsufficiency in the supply of foodstuffs and simple industrial products placed the area in a delicate and precarious situation.

The medium term impact on the small scale agricultural sector contrasts with the relatively rapid recovery of the large scale commercial banana plantations. Access to autonomous capital resources which could be dedicated to repairing transport and export infrastructure and the priority given to the export sectors by the government were key factors in this differentiated process.

A second sector that was very obviously severely affected was the tourist industry, particularly the small or medium scale sectors outside of Limon. Many small communities on the Atlantic Coast to the south of Limon

(Cahuita, Puerto Viejo, Punta Uvita and Manzanillo) rely heavily on tourist incomes. Coastal uplifting and the widespread depositing of fallen timber on beaches following the August flooding, combined with the medium term isolation of the area by road and an inherent "fear factor" among potential visitors, drastically reduced tourist flows to the Atlantic Coast. As late as October, tourist industry representatives in Cahuita indicated that visitor levels had dropped to 20% of normal rates.

Finally, the broad sector of the population which suffered destruction or severe damage to their homes, comprise a notoriously deprived component of the "permanently" affected population. Reliance on a slow process of government based replacement housing construction has left a reportedly majority sector of the population without an adequate dwelling nearly a year after the quake, whilst some groups were still living in temporary shelters at the end of 1991. Some other groups, that have received new housing, complain that the difficulties in restoring adequate running water have left them with homes but no on tap water.

The perceived lenthitude in the overall reconstruction process, especially in that relating more directly to the needs of the poorer urban and rural sectors has been a constant theme during the year following the quake. Once the initial difficulties faced in the logistics of early relief efforts had been overcome (victim search, distribution of food and potable water etc.) and a relatively successful completion of the emergency stage of the disaster had been achieved the following periods of rehabilitation and reconstruction have been plagued with problems related to the magnitude and complexity of the infrastructural damage; priorities in the assignation of resources; and lenthitude in the mobilization of financial aid to the region.

This situation generated numerous protests and mechanisms of pressure exercised by different regionally based organisations and individuals. These transcended the demand for a more rapid and agile attention to the problems caused by the quake, searching to bring the historical abandonment and developmental problems faced by the Atlantic Coast region to the forefront. As such, the nature of the social movements generated in the aftermath of the quake suffered a qualitative transformation from an early concern for the immediate resolution of particular problems to a more broad concern for the future global development of the region.

A relatively early manifestation of this process was

expressed in a publication, put out by the Limon Popular Emergency Commission (PEC) and printed in La Nacion on May 4. The Commission formed on April 28 under the auspices of the Limon Federation of Workers (FETRAL) grouped together representatives of unions, churches, nongovernmental organizations, community associations, municipalities and other organized sectors of the Limon City population, in response to the felt need for popular participation in the ongoing relief efforts.

In this publication, the PEC expressed its resolve:

"to avoid the discriminatory use of aid, to combat speculation and to energetically avoid confusing the HISTORICAL PROBLEMS of the province with those caused by the quake, or that the resolution of these latter problems be considered a solution for the historical problems".

Moreover, it ended by insisting that:

"the reconstruction of Limon will not be possible without the participation of the people organized in union, popular and religious organizations."

Following a month of consternation and protests by numerous organized groups, various government ministers including Rodolfo Mendez Mata, Minister of the Presidency, were subjected to severe criticism in an open session of the Limon municipality celebrated on May 22. Representatives of popular organizations were reported to have amply criticized the persistent problems associated with the lack of potable water, closed schools, destroyed roads and bridges, and malfunctioning hospitals. (L.R. May 23, p. 4a). Faced with these criticisms, Mendez Mata somewhat realistically pointed out that "it is impossible to reconstruct in 30 days what took years to build". Somewhat less realistic, however, was the reported statement by Guillermo Madriz, Minister of Public Works and Transport, in the sense that in the course of the following six months "no sign of the earthquake will remain" (L.N. May 22, p. 5a).

At this time, the problems felt on a global level were tinged with the idea of discrimination on a social level. Echoing comments on the privileged nature of the response to the needs of the banana export sectors and the marginalization of thousands of small land holders, Limon's Bishop Alfonso Coto argued for the need to work in response

to the "human drama" lived in the Province and that "the government should not only work to increase foreign earnings ... more important than bananas are thousands of affected persons", who should be treated "with the respect and dignity they deserve" (L.N. May 23, p. 5a and May 22, p. 5a).

The early fears expressed by many popular sectors of the region as regards their marginalization from the fruits of the reconstruction effort, was newly brought to the forefront some months later with the publication of a full page paid document which appeared in the August 11 edition of La Nacion (p. 25a). This time, however, it was the Directorate of the National Chamber of Banana Producers which was voicing its protest, apparently not in favour of its own interests but rather in support of the popular sectors. In an emotive statement, the Chamber commenced by indicating the manner in which the earthquake

"highlighted the needs of Limon Province, which has traditionally been ignored as regards the material, moral, and spiritual development of its citizens. The efficient job done by the government during the early moments of the tragedy raised our hope that the State would finally give it's undivided attention to the Atlantic Zone. However, four months after the earthquake Limon has obviously been forgotten once more."

Following this opening statement, the Chamber demanded that the government implement definitive solutions to the "dismal conditions of the roads and infrastructure", "rubbish piled up in the city", "rubble left by the earthquake", "the lack of running water and the construction of new distribution systems", "insufficient health services", and the "absence of concrete policies and government support for self help initiatives". The publication concluded with a "respectful but vehement" demand that the President of the Republic establish

"AN ACTION GROUP OF THE HIGHEST STATUS which, shoulder to shoulder with the citizens and institutions of Limon should execute the public works and programs that the province urgently requires, taking corrective measures to adequately attend the wishes of the "limonenses" for moral and spiritual development, guaranteeing their health and physical wellbeing".

The popular sector's and union's public enemy number one,

was now apparently its principle ally . However, the political connotations of the publication and a possible "class alliance" opportunism quickly came to the forefront when~~x~~ the Chamber published a second full page document the following day titled "And the third quay for Moin, what's happening ? " (L.N. August 12, p.25a).

In this publication the Chamber undertook a virulent attack on the government for the lack of action taken during the two previous years in the agreed building of a third export quay facility in the congested Moin area, pointing out that the "banana sector has contributed more than \$17.5 millions to finance the work since July 1989, without a single cubic metre of material having been moved to date".

The publications emitted by the Chamber rapidly followed up on by La Nacion, a newspaper closely linked to the agroexport sectors in the country. In its editorial page of August 14 (p.14a) and in the wake of ongoing severe flooding on the Atlantic Coast, the newspaper wrote:

"Faced with the new and difficult test that this region is now stoically facing, the State needs to revise its position as regards the Atlantic zone. If this has been so severely punished, it should at least enjoy preferential attention from the State and society. Man cannot impede earth quakes and tropical storms, but it is possible to mitigate the suffering of the area's inhabitants through prevision and an attitude on the part of the State which contemplates the global development of this region."

Calling for a strengthening of the National Emergency Commission and criticizing the "lack of action or inefficiency of the State", La Nacion openly attacked JAPDEVA (the decentralized State agency encharged with promoting development on the Atlantic Coast), public sector unions, the lack of attention to the social problems of the province, and, echoing the Chamber's earlier publications, "the government's persistent abandonment of port infrastructure which negatively affects imports and exports, and the national economy in general".

This series of three publications whilst openly demanding increased support for the province's overall development needs and for the export sectors in particular, could also be interpreted as a reflection of growing fears of disrupting social dissent in an area typified, historically, by high levels of organized social protest (see Valverde, Vargas and Lavell, 1987). The strategic position of the region in terms of export agricultural production and port infrastructure caused undoubted concerns as regards possible long term disrupting labour strikes and more generalized forms of social pressure.

La Nacion was, in fact, very explicit as regards the forms of social organization in Limon when it referred to:

"the power of the public sector unions in Limon which have consumed a good part of the resources that should have been used to promote the social and economic wellbeing of the province. How much money has been spent on bureaucracy and how much on real

development? Is it not true that hubs of union power have been established that do as they wish, seriously damaging the national economy?"

A "conspiracy" note was introduced into the lead article when La Nacion stated that the problems of the province:

"had not stimulated action on the part of the State. Rather they have been a stimulus for demagoguery and the organization of planned street protests generally led by persons interested in achieving, enhancing or maintaining personalistic leadership roles".

The overall impression gained from an analysis of the quoted publications, and considering the social situation in Limon, is that of a growing fear that a particular social crisis period (related to the earthquake and land flooding) in the context of a region suffering a permanent historical development crisis, could provide fertile ground for the outbreak of generalized forms of social protest guided by politically motivated interest groups.

The overall impact of any such development would be serious in national political and economic terms.

As regards the explicit demands made by La Nacion and the Chamber, little advance has been made to date in the construction of the third quay, but the government did heed the Chamber's call for the establishment of a high level action group included in its first publication. Thus, shortly afterwards a Governmental Intersectorial Commission was formed, coordinated by Enrique Montealegre, Presidential Advisor on Emergencies and Disasters, to take over the reconstruction strategy and activities from a somewhat beleaguered National Emergency Commission (See following section for a detailed analysis of the NEC).

The Commission, composed of representatives of the principle government ministries and decentralized agencies responsible for reconstruction activities, clearly had its own problems. Thus, on October 22, six months after the quake and a couple of months after the instigation of the Commission, Montealegre was quoted in La Nacion (October 23, p.5a) to have admitted that "each institution is working on its own, and because of this it is difficult to quantify the progress made".

In the opinion of important sectors of the local population clearly not much had been achieved and certainly Guillermo Madriz's earlier May prediction as regards the

total resolution of the problems within six months quickly passed into the annals of enlightened wishthinking.

The negative attitudes of the local groups came to a head in October when on the 16th various organized groups blocked the access to the city of Limon for six hours in the area near to the RECOPE petroleum refinery. The blockade was raised when Minister of the Presidency, Rodolfo Mendez Mata, agreed to travel to Limon to meet and negotiate with members of the Municipal Council and organized group leaders brought together under the umbrella of a recently created Executive Commission of the Open Session (Cabildo Abierto) of the Municipality.

Although Mendez Mata severely admonished the blockade, attributing such an action to "a reduced number of leaders" who were opposed to the majority feeling in favor of "dialogue and negotiation", the action would appear to have counted on the implicit or explicit support of various population groups and social sectors (see L.N. October 18, p.5a and L.R. October 18, p.6a). La Nación reported that the blockade was raised by "neighbours and students from Limon's Central Canton... (and) was supported by municipal workers, local commerce and the JAPDEVA union". The municipal workers declared an indefinite strike from midday onwards, and "at least 90% of commercial establishments in the city centre closed from 10 am - 2 pm".

Dr. Eric Castro, spokesman for the Executive Commission of the Open Session, explained the actions in terms of the lack of economic support for the region on the part of the government, adding that the "blockade was only the beginning of more far-reaching protests" (L.N. October 18, p.5a). Moreover, local leaders were also reported to have criticized the Government Intersectorial Commission established to negotiate with the community because "it is made up of middle ranking officials without the power to take decisions" (L.R. October 18, p.6a).

On Monday, 21st of October, Mendez Mata journeyed to Limon along with various other Ministers and Underministers to negotiate with the members of the Executive Commission. Commission spokesman Castro indicated that the negotiations sought to guarantee "a greater flow of resources in order to combat the historical problems of the province... which were aggravated by the April 22, earthquake" (L.N. October 19, p.5a).

The atmosphere of the negotiations was tinged with antagonisms and party political divisions. Thus, Mendez Mata had earlier objected to the Executive Commission which "showed a confrontive attitude conducive to the breakdown



of conversations", whilst President Rafael Angel Calderon was quoted as having attributed the October 16 protests to "a small group with ulterior intentions who did not have the support of the people" in the organization of the blockade (L.N. October 19, p.5a). On the other hand, certain members of the Executive Committee were already under pressure according to their political party allegiances. The negotiations commenced under the threat that should the dialogue breakdown new protests would start up including a new blockade and an indefinite general strike, which would include the municipal and dock workers (L.N. October 21 4a).

According to local press reports, the results of the negotiations were constructive, and undertaken in a frank and cordial manner. A calendar of meetings, between October 23 and November 14 was decided on. These meetings, dedicated to the discussion and resolution of problems relating to health, housing, infrastructure, banana taxes, education, public security and the possible privatization of RECOPE and JAPDEVA would be attended by high level government representatives (including Ministers and Executive Presidents of government decentralized agencies) and members of the Executive Commission of the Open Session. The end of the dialogue between Mendez Mata and local representatives was also marked by his announcement, a day later (October 22), after attending a meeting of the Governing Council, that the government would invest 12 billion colones (\$92 millions approximately) in Limon. According to La Nacion (October 26, p.8a), Mendez Mata categorically affirmed that the investment in the Atlantic zone would more than overcome the problems caused by the earthquake and "turn the region into a privileged place" compared to the rest of the country.

Given the sum quoted, this latter statement seems to be as overly optimistic as Guillermo Madriz's earlier "six months prediction". In itself it represented less than half of the \$200 millones the NEC had estimated was required merely "to bring (the region) back to the existing conditions prior to the earthquake" (Mendez, 1991), and under a quarter of Mendez Mata's own May estimate of 50 billions total losses.

Controversy over the lentitude in channelling reconstruction funds to disaster stricken areas had flourished in Costa Rica in the aftermath of October 1988 flooding in Pacific Coast areas during Hurricane Juana, and following the 1990 quakes in Cobano, Puriscal and Alajuela. In the case of Limon similar problems were clearly being faced.

During the very early days following the April quake the government had been quick to announce the agreed reassignment of international credits for reconstruction purposes already approved for Costa Rica, and the negotiation of fresh funds. This was the case, for instance, with two credits from the World Bank for \$60 million and \$20 million dollars, a \$20 million dollars loan from the Interamerican Development Bank and \$ 18 .8 millions from the Venezuelan Investment Fund (see L.N. April 24 pp.4a, 5a; L.N. April 25 p.11a; L.N. April 26 p.4a).

In general, the prognosis was that these funds would be rapidly available to commence reconstruction activities and that the National Congress would alleviate the normal procedures for approving and assigning such funds.

This would not appear to have been the case. In late July, for example, the Congress approved in first debate a plan for investing 11.95 billion colones to finance a series of infrastructural works in Limon and for overcoming problems caused by Hurricane Juana (October 1988). 7.5 billion colones were assigned to Limon and the rest to Costa Rica's southern zone. (L.N. July 31, p. 6a). These funds were the same international funds being commented two days after the quake. And, both were probably related to the 12 billion colones promised by Mendez Mata on October 22!. On this latter occasion, it was stated that the funds would come from loans obtained from the World Bank (\$35 millions), the Interamerican Development Bank (\$22 millions), the Venezuelan Investment Fund (\$10 millions) and the Central American Bank for Economic Integration (500 million colones).

Whatever the precise details of the whole problem of financing, the government clearly faced a series of difficulties related to the overall logistics and coordination of any proposed reconstruction and development process. Moreover, this end of year situation was also complicated by the latent or real conflicts and contradictions between the Limon based popular organization representatives themselves. La Nacion, in its October 25 edition (p.8a) concluded that.

"if, on the one hand, everyone in Limon is after the same thing - improvements in the province - it is also true that the behaviour of the local leaders could, paradoxically, ruin the little that has been achieved during months, especially as regards the expressed disposition of the government to instigate immediate actions".

Strategy differences between different members of the Municipal Council and Executive Commission came forth notoriously during October, underpinned by clear party political differences. The more conciliatory attitude proposed by "Social Christian party members of the Limon Municipal Council and independent politicians and professionals is not wellconsidered by various members of the Executive Commission who demand immediate solutions", wrote La Nacion (October 26, p.8a). According to the newspaper this situation was leading to pressures from the Social Christian block to replace five members of the Executive Commission including its president, Marvin Wright (Authentic Limon Party). and four National Liberation party sympathisers, including Eric Castro. Moreover, the newspaper reported that the important Federation of Limon Workers (FETRAL) would be willing to participate in the Open Session if the five objected members were removed. According to FETRAL these lacked support within the Community and were "coloured politically".

Divisive forces, internal infighting and problems of coordination at national government and local organization levels, combined with bureaucratically slow assignation procedures at a legislative level seemed to capture the tone of the reconstruction efforts in Limon during 1991. In the meantime the population was, in general, immersed in even more acute levels of poverty and unemployment than previously. Preexisting institutional and political characteristics, and contradictions at a national and regional level and historical problems were clearly coming to the forefront during a particular social crisis period triggered by the quake.

#### 4. Institutional and Organizational Responses During the Emergency Period.

The earthquake undoubtedly took both the national authorities and the Atlantic region basically by surprise and unprepared. Many of the problems encountered during the immediate relief effort and the institutional solutions implemented undoubtedly reflect preexisting organizational vulnerabilities, interacting with a complex territorial or geographical context. The adequate coordination of a relief effort played out over some 13000 sq.km and potentially aimed at over 200000 people, many located in dispersed communities on the Atlantic Coastal plain and in the adjacent upland areas, is, under any circumstances, a complex task. This was even more so in Costa Rica, a country with an incipient and underfunded "disaster management" system, no armed forces or air hardware reserve, and scarce economic resources. Moreover, the fact

that important sectors of the inter and intra regional land transport network was severely damaged during the quake impeded easy access by land to many parts of the affected area for weeks or up to months after the event. transport network was severely damaged during the quake impeding easy access by land to many parts of the affected area for weeks or up to months after the event.

Despite the serious difficulties faced during the two weeks following the tremor which we will analyze in detail in this section of our document, the relatively successful overall relief effort under difficult conditions can be attributed to the rapid adaptability to the circumstances shown by many of the organizations involved and to the enthusiasm and self-effacing commitment of many different institutions and individuals. In highlighting the problems faced our objective is not to present an academically sterile, critical and negative analysis, but, rather, to provide an evaluation which constructively identifies needed changes in the future.