

4.1 The overall context:

Very early on during the immediate post impact numerous complaints were voiced regarding the territorial access to basic needs such as food and potable water and in terms of the priorities established in the rehabilitation process (repairs to basic infrastructure in particular). These dissenting comments were voiced at a local level, through population groups and their representatives (church, unions, Red Cross etc.) at the national Parliamentary level where at times heated exchanges were reported between members of the opposing majority parties (Social Christian and National Liberation). It was the National Emergency Commission which was the focus of this conflictive environment.

On an intraregional level apparently contradictory statements were reported from popular representatives in different zones. Thus, whilst the population of Limón "complained of being ignored by the NEC, assuring that they have only been sent to distant regions" (L.R. April 26, p.8a) local groups in the outlying Turrialba area (Cartago) were voicing their concern that "they have been passed by the NEC, which has directed all its attention to Limón" (L.R. April 26, p.8a).

Concern for the population living in outlying, mountainous areas in southern and mountainous areas of the area was expressed by different professional and political groups. This was particularly so in the case of indigenous Cabecar and Bribri populations of the mountain and valley areas, many living proximate to the epicentre in the Telire Valley.

Isolated by land, due to damage caused to local bridges and extensive landslides, early fears were expressed regarding a potentially high loss of human life among the indigenous population. (see L.N. April 26, p.14a; L.N. April 26, p.16a; D.E. April 27, p.7). Although such concerns later proved to be unfounded, many indigenous communities in the south of Limón received their first supplies outside from four and up to seven days after the quake of May 1, p.10a; L.N. April 27, p.16a; L.N. April 29 pp. 4a.

Perhaps the most notorious case was reported in an edition of the English speaking weekly, the Tico Times. A community of Cedra located in the upper reaches of the Banano River Basin had received no help until the second of June when two residents of the community managed to hit the city. According to the Tico Times, the authorities did not know the community existed.

In addition to the problems faced in the distribution of food, certain concerns were expressed in terms of the priorities assigned to early rehabilitation efforts to basic infrastructure. Electricity supplies were rapidly restored in a good part of the region, and a reported 40% of the potable water distribution system was supposedly restored a couple of days after the quake in Limon City. Moreover, rapid progress was made in reconditioning the major highway between Limon and San Jose and in restoring export facilities in the Limon-Moin port area.

This series of "priorities" could probably be amply justified on a social and economic level. And President Calderon, the day following the quake, clearly indicated that priority would be given to the evaluation of damages to basic infrastructure given that 80% of the country's exports were channelled through Limon and that "national production cannot be paralyzed". (L.N. April 23 p. 2a Special Edition).

However, this argument did not convince everyone. The National Council for Small and Medium Scale Producers "Justice and Development" was quick to place the discussion on a more global and politically sensitive level. Thus, just two short days after the tremor the Council suggested that "the Government has only considered the export banana sectors in its emergency plans for Limon. Small and medium scale producers are unprotected and disastrous consequences will be felt very soon" (L.N. April 25, p. 13a).

This concern and its wider social implications would become an overriding theme in the coming months, as we have illustrated in the previous section of our document. A month later, for example, in a series of articles put together by "La Nacion," emphasis was given to the plight of the poorer small scale land holders, to difficulties in rehabilitating the short term production of crops, and to the lack of adequate food supplies given the drying up of the emergency distribution mechanisms (L.N. May 23, p. 5a). The demanded role of the State was being taken up by such organizations as the European Economic Community, the Union of Small Scale Producers of the Atlantic (UPAGRA) and various ecclesiastical and humanitarian groups.

Although it is difficult to establish the exact extent to which priorities and distribution mechanisms were deliberately spatially and socially selective without more detailed and in depth research, there is no doubt that differential short term access to aid was experienced both within and between zones.

Various explanations were offered, ranging from the eminently technical or logistical to the openly political. Undoubtedly the truth lies mingled somewhere in the midst of the explanations offered.

From a logistical perspective, Rodolfo Mendez Mata, Minister of the Presidency, was quoted as having argued that "Limon was isolated by land, and 55000 families had to be attended using airtransport such that the possibility of helping everyone was extremely limited" (L.N. April 27, p.4a). This was undoubtedly true in terms of regional or zonal access given the wide dispersion of communities and the limited number of airborne units available.

Costa Rica has no airforce and only a limited number of small planes and helicopters in the hands of Public Security and other government agencies. Although various foreign governments and regional organizations made airborne transport available (particularly Nicaragua which sent five helicopters and The United Nations Vigilance Group for Central America (ONUCA) which provided three choppers), the range of demands for food distribution, evacuation of the injured and transport of repair equipment, put an undoubted strain on the available human and material resources.

A good part of the distribution of aid to dispersed and outlying communities was absorbed by experienced Nicaraguan Sandinista pilots who received widespread public acclaim from onsite workers, government officials and the local press for their tireless dedication and the seemingly endless numbers of sorties flown (see L.N. April 27, p.16a; L.N. April 29,)

The contribution of the Sandinista pilots and that made later by army engineers in bridge reconstruction, was to have an interesting sociological and political impact on Costa Ricans, rapidly changing the negative opinions (in ideological and nationalist terms) held by a good part of the population and built up over the period of the Sandinista Revolution in Nicaragua during the 1980's. The humanitarian efforts and the aid proffered by the Nicaraguans (including \$5 millions dollars in financial terms), led Guillermo Madriz, Minister of Public Works and Transport to praise such help, given in the midst "of their own poverty" (L.N. May 23 p. 5a).

This humanitarian aid (obviously tinged with other considerations of a political connotation), stands in contrast to the relatively limited bilateral help proffered by far more affluent governments, including the U.S. and Britain.

The U.S. provided \$ 5 million dollars for road and bridge repairs through it's Agency for International Development (AID) and human resource aid through the Army Corps of Engineers. Some doubts could have been raised as to the motivations behind the financial help, when the Tico Times quoted Douglas Tinsler, AID Deputy Director, as having explained the U.S. governments' contribution as a gesture of satisfaction with Costa Rica's efforts to "make its economy healthy" (TT May 24 p.4). Even

disasters seem to maybe form part of the debate on structural adjustment and neoliberal economic policies!

The logistical difficulties faced, were not, however, the only factor contributing to the early problems in aid distribution. A second series of observations pertain to the absence of a prestablished, organized emergency strategy with clearly delineated lines of authority and role definition.

Although the National Emergency Commission is by law the maximum authority and coordinating body during emergency situations, the early days in Limon and Turrialba were typified by the uncoordinated role of numerous national and local governmental organizations, non governmental organizations and popular group representations. The national daily, La Prensa Libre, which seemed to specialize in highlighting problems and conflicts, summed up the situation in its April 26 edition (p.2) when it wrote:

"The organization of decision makers, the manner in which assistance has been channelled and an unstabilizing situation where there are more 'chiefs than indians' comprises a bottleneck which is undermining all of the ongoing efforts... Whocan resolve this problem? This is a difficult question to answer given that the NEC, Public Security and Health authorities, autonomous institutions and local authorities are all giving orders which are at times at cross purposes and bely the fundamental objective of making food and water available to everyone, not only in the centre but also in outlying regions"

Very few clear examples of disorganization or interorganizational conflict were reported in the press which could help to substantiate the global evaluation offered. But, corroboration for this came from Humberto Trejos, Executive President of the NEC, who also commented on the "Chief /Indian" problem (L.N. April 27. p.4a); from Carlos Rojas, National Deputy for Limon, who declared that "there is lack of coordination, but this can be overcome" (L.R. April 27 p. 8a), and from numerous union, ecclesiastical and non governmental organizations.

The only clear case commented in detail in the press appeared in the April 28 edition of "La Nación, in an article entitled "Clashes between the Red Cross and the National Emergency Commission".

The newspaper reported that unnamed sources suggested

that the Red Cross had been discriminated against in terms of needed logistical support (air transport) for mobilizing food, medical and sanitary personnel. And, in terms of access to equipment for rescue operations. Later conflicts were also reported between the Red Cross and the newly formed Regional Emergency Commission.

The organizational problems faced in the early emergency period were increased, according to various observers, by overt party political maneuvering. When faced with the criticism that the NEC had become overly politicized in its decisions, Humberto Trejos, whilst denying the accusation, was also quoted as stating that "perhaps there have been occasions where non experts have imposed their criteria in view of their political investiture" (D.E. April 27 p.7). A day later he was also quoted as saying that "some politicians were interfering with the work of the Commission" (L.R. April 28 p.6a). National Liberation Party deputy Reynaldo Maxwell was more explicit in openly criticising the "improvisation and political criteria imposed by (Limon province) Governor Leidy Chacon and (Limon City's) municipal president" (D.E. April 30, p.3). And, the call for greater government coordination expressed by National Liberation parliamentarians Rodrigo Oreamuno and Victor Emilio Castro, was given a more explicit political overtone by co-benchers Sigfrid Aixa who demanded that the aid approved by Congress should go directly to the affected population and not be used "to pay political bills" (D.E. April 27, p.4).

The criticism by the opposition party congressional members was duly rejected by various Social Christian deputies, and one of them (Danilo Chaverri) could not resist reminding Liberation members of the fraud perpetrated with 300 million colones of NEC funds during the early 1980's. This scandal had led to a prolonged legal case involving, among others, ex-National Liberation President, Luis Alberto Monge and Vice president Armando Arauz.

Following such skirmishes no one was really convinced when Rodrigo Oreamuno stated that "we are not interested in obtaining political gains from this situation" (L.R. April 27 p.8a).

The collective problems suffered during the first days of the emergency and the need for rapid correction mechanisms was adequately synthesized by La Nacion in an influential editorial article published on April 26, where it wrote:

"Whilst we recognize the celerity with which

the government acted... there has, however, been a lack of organization... A defined central authority is required... moreover, there is an urgent need to delegate authority in experienced and caring persons in order to rapidly attend to certain zones which have not received help and, also, to establish fluid channels of communications oriented by clear normative standards."

After four days of internal wrangling and public protest and on the same day as La Nacion's lead article, the Central government was to institute changes in the organizational set up, establishing clear lines of authority and a social and spatial division of responsibilities and roles.

The changes implemented were to help prevent an intensification of the limited number of "antisocial" acts experienced during these first days. Looting of the National Production Council stores had been reported in the Cieneguita area of Limon City, in Valle de la Estrella and in Sixaola, and numerous cases of speculation with the price of scarce food stuffs were registered, particularly in Limon City. (P.L. April 26 p.2; D.E. May 2, p.9; D.E. April 26 p.5; D.E. April 29, p.10; L.N. April 25).

4.2 Institutional and Organizational Changes.

On April 26 the government announced that the Presidency and the Governing Council were to take over the global coordination of the short term relief efforts and the distribution of food stuffs and basic needs.

President Calderon named his Minister of the Presidency, Rodolfo Mendez Mata, General Coordinator of the relief effort; Minister of Agriculture Juan Rafael Lizano, Coordinator in the Limon area and in the south of the province; and the Underminister of Agriculture was entrusted with the logistics at Limon's airport. Executive President of the National Institute for Housing and Urbanism (INVU), Juan Luis Delgado, was named head of mission for the communities of Bataan and Zent; Second Vicepresident, Arnoldo Lopez Echandi, and the Ministry of Foreign Affairs were to centralize the requests for and reception of international aid and the First Lady, Gloria Bejarano, national contributions to the relief effort. (see L.N. April 27 p.4a).

Despite veiled attempts to soften the "fait accompli" the National Emergency Commission was clearly the principal victim in this new institutional arrangement.

From the commencement of the Emergency, problems of hierarchy and coordination, and the conflicting or duplicated roles played by different agencies or organizations belied the overall coordinating role the NEC is assigned by the country's National Emergency Law. Thus, although the NEC is made up of representatives (at a ministerial level or equivalent) of major government agencies (Public Works and Transport, Health, Electricity Institute, Public Security and Agriculture amongst others) and of nongovernmental humanitarian institutions such as the National Red Cross, and its president and general coordinator are named by the President of the Republic, the overall coordinating role assigned to it was never accomplished. The range of demands existing during the first days after the quake; emergent hierarchies, roles and statuses, the undue involvement of political criteria in the decision making process; and the limited human, technical and material resources under the direct control of the NEC, undoubtedly combined to undermine previously established legally defined operative criteria.

Some of these aspects have been commented earlier. Moreover, Humberto Trejos was to confirm a number of others in a series of statements reported in the press on the 27th and 28th of April, following the government's decision to place overall coordination in the hands of the Governing Council and its delegated representatives. Thus, Trejos was reported as having stated that from the beginning the NEC had no responsibility for "food distribution in Limon City" (L.N. April 27, p.4a), given that it was "not prepared for such a task" (L.R. April 27 p.4a). And, in accord with a division of responsibilities established immediately following the quake, the Commission was entrusted with attending refugee shelters, the evacuation of the injured and the provision of aid to isolated zones to the south of Limon, according to Mendez (L.N. April 27, p.4a). Finally, he also indicated that the presence of non governmental agency representatives in the NEC, such as the Red Cross, required respect for their autonomy in decision making (L.R. April, 27 6A).

The overall coordinating role of the NEC was reduced from the beginning to the control over a series of particular, if important activities, some of which (evacuation of the injured, for instance) complied to the direct role status of other specialized organisms (Red Cross, Ministry of Health etc.)

The government reorganization came then more as a measure to establish a clear line of hierarchical control and overall coordination amongst numerous disparate organizations (including the NEC), rather than as a

substitution of one coordinating authority for another.

The explanation attributed to Rodolfo Mendez Mata for the change to central government control, in the sense that "when something happens which transcends the powers of the NEC, organization becomes an action of government," did not exactly ring true. (see L.N. April 27 p.4a). After all, the coordinating powers of the NEC were, according to law, total, both in the phase of emergency relief and during the reconstruction phase.

Perhaps it was La Nación, once more, which summed up most adequately the organizational situation vis a vis the emergency. In its editorial of the 4th of May (L.N.p.14a) La Nación concluded that "the earthquake in Limon has tested our fortitude and capacity. From now on it must test our organizational capacity". Referring to the binomio NEC/Central Government, it pointed out that:

"the NEC has done an enthusiastic and responsible job but lacks resources and power. As regards the government, its actions... depend in good part on the responsibility shown by its members... the country lacks an ideal type of organization ... As in a war, we must have a specialized structure, completely familiarized with its role, with financial and technical resources and sufficient personnel, capable of operating rapidly and efficiently in accord with an established methodology, an action plan and a series of basic concepts."

The governmental reorganization of April 26 was accompanied by the formation of a Popular Emergency Commission, instigated by the Federation of Limon Workers (FETRAL), and made up of representatives of diverse popular groups, churches, unions and communities which jointly shared in the responsibility for food distribution in Limon City.

The organizational problems faced during the first week were remedied in good part following the reorganization of hierarchies and roles. This process was helped by a rapid learning experience amongst participants, the reopening of land transport facilities from San José to Limón, a return to semi-normal commercial food distribution systems in Limon City and the fact that the search and rescue and primary sanitary control phases were now considerably less onerous.

By the 1st of May the NEC declared an end to the phase

of mass food distribution (L.N. May 2nd p.12a). And, on the 28th of April the authorities had already announced the beginning of the Reconstruction phase guided by a Master Plan, and coordinated by the NEC.

A global evaluation of the organizational aspects of the Emergency phase and the ensuing institutional weaknesses and strengths confirms certain a priori ideas held previous to the quake. (see Madrigal, 1991; Lavell, 1991)

The undoubted professionalism, self sacrifice and enthusiasm of the technicians linked to the NEC could not substitute certain existing institutional vulnerabilities. The lack of adequate financial resources and fully trained staff, incipient results in terms of the organization of regional and local emergency committees, the lack of real on site experience with a major disaster and of preexisting Emergency plans, undoubtedly hindered the achievement of rapid and efficient coordination mechanisms and the distribution of aid to widely dispersed areas.

The incentive given by the 1988 menace from Hurricane Juana, and the series of earthquakes experienced during 1990 (Cobano, Puriscal and Alajuela) had led to increased activities and concerns on the part of the Commission but had not led to the promotion of a fully fledged disaster management system in a country which is particularly exposed to a wide range of potential disaster agents.

Here, one is tempted to bring to mind the discussion in the Anglo Saxon literature on the organizational needs for such qualitatively distinct situations as "accidents", "emergencies", "disasters" and "catastrophes" and conclude that in Costa Rica the system has been geared up to deal with the first two situations but not with the complex panorama presented during a disaster of the magnitude experienced in Limon.

Apart from its exiguous sources and levels of financing, the NEC has suffered a number of stigmas over the last few years, none of them the making of the present authorities, and which have had effects in terms of its status, power and credibility at a political and public level.

The scandal around the 300 million colones fraud during the Emergency declared due to drought in the province of Guanacaste in 1983; and the more or less constant questioning of the National Emergency Law due to its overly flexible nature have constantly haunted the NEC authorities.

In the case of the fraud, which severely affected the

images of various top politicians, this "original sin", as Bernardo Mendez Antillon, Executive Director of the NEC was to refer to it, surfaced on at least a couple of occasions during the months following the earthquake.

Thus, in July two Commissions were established, one at the National Assembly level and one organized by the popular movement in Limon itself, in order to investigate the use of the funds channeled via the NEC. Given the supposed lack of reports presented by the NEC queries were raised, particularly by Reynaldo Maxwell, deputy for the National Liberation party, as regards the amount of funds collected for relief effort. (L.N. July 21st, p.6a)

The possible political motivations of Maxwell were routinely questioned, and the NEC promptly published a full page, audited report on income and expenditures (L.N. August 5th, p.13 a) following Mendez Antillon's observation that "people tend to think that we steal or hide the money... unfortunately we have an original sin and for that reason we are willing to offer whatever information is required" (L.N. July 21, p.6a). But, this time it wasn't the NEC that was hiding the money. Rather, it was the National Congress which took over three months to finally approve and dispend the "emergency" budget allocated the NEC and originally announced a few short days after the quake!.

Then, in November, the Comptroller General's office put out a report on the systems of financial control exercised during the Emergency. Here it commented that tasks were undertaken without a previously elaborated emergency plan which would allow the establishment of priorities in the allocation of resources and their efficient use. Although no anomalies were noted, the document did criticize the lack of standardized and centralized procedures for the reception and registering of funds, the absence of signatures on receipt of the majority of aid distributed by helicopter, the informal manner in which repairs to the Limon-San Jose highway were contracted and the lack of controls permitting an evaluation of the pertinence of the decisions taken (see L.N. Nov. 12, p. 5a).

For over six years the Comptroller's Office had been critical of the flexibility of the National Emergency Law and the manner in which it had been used to declare states of "National Emergency" for almost any economic or social problem faced by the country, allowing the government to bypass many of the rigid financial controls demanded by the Constitution in the use of public funds.

Thus over the years, the government had declared a state

of national emergency not only in cases such as Limon, Juana or Alajuela but also as regards such "national" problems as the housing sector, road construction, remodelling of the international airport, construction of the Orosi dam and electric generating facility, and improvements in the metropolitan area water distribution systems.

The declaration of a State of National Emergency automatically converts the NEC into the coordinating body for the proposed activities and the depository for assigned government funds. From these it "earns" a 2.5 % commission which comprises part of its annual budget for administration and running costs.

This situation leads to an obvious confusion in terms of the particular technical role of the Commission and distracts from its specialization as a fully fledged emergency management system. Moreover, it is not difficult to appreciate that an important part of the NEC's financing depends on the government declaring states of "national emergency" with certain regularity (since 1983, different governments have declared over 40 emergencies). Such an exiguous form of financing for the Commission is obviously not very convenient.

The earthquake, and the August flooding, served to reanimate the debate on the National Emergency Law to the extent that La Nacion produced, another of its hard hitting and virulent editorials in its August 13 edition (p.14a) Under the title "Emergency as Leg Pulling", the newspaper wrote that "the declaration of Emergency has been used to cover up administrative incapacity and avoid legal controls. This makes any type of anomaly possible and takes us back to the dark ages when direct or private licitations were the source of corruption and nepotism (compadrazgo)".

The problems faced during the Emergency and Reconstruction phases, the relatively prolonged agony of the NEC (which received a second coup d'etat, when its role as coordinator of the reconstruction phase was transferred to a newly created central government controlled Intersectorial Commission), pressure from the press and the public, plus the process of internal evaluation under taken led to the inevitable search for changes in the future.

A major step in this direction took place towards the end of September, when the NEC promoted a meeting under the auspices of the U.S. Agency for International Development, in order to establish the framework for the formulation of a previously absent National Emergency Plan. Thirty two governmental and nongovernmental agencies participated in

the meeting.

With a projected date for completion of the plan by mid-November, sectorialization of activities in order to avoid conflicts in roles and problems of coordination, the allocation of contingency funds within each sector's annual budget to attend possible emergencies, and the overall financial control and coordination on the part of the NEC appeared as basic premises for the plan. The plan had not in fact been completed by March 1992.

The analysis and evaluation of the Plan and its efficacy will inevitably have to await a new onset of dramatic circumstances, which, despite any wishes to the contrary, is inevitable in the short, medium or long term in a part of the world which is particularly vulnerable to the instability of its physical milieu.

In the meantime, the country has undoubtedly experienced an increase in the number and type of educational and scientific activities promoted around the idea of the prevention and mitigation of disasters. Thus, the Limon earthquake and the series of other disasters suffered during the last three years would seem to have raised the national consciousness as regards the need to plan and prepare for circumstances which are an inevitable component of "daily" life in the country.

5. Social Communication and Disasters: Some observations deriving from the Limon earthquake.

A major component of the analysis presented in this chapter has been based on a detailed reading of the press coverage of the quake. The role played by the written press and the T.V. and radio cannot be underestimated, neither in terms of the transmission of information nor in terms of the formation of public opinion and mental images and constructs of disaster.

This theme will inevitably have to be the subject of detailed analysis based on precise methodologies of content analysis. But, it is possible at this state to make some pertinent observations.

In this sense, it is clear that the press played an important role in the highlighting of problems of isolated communities and potential or real conflicts in the organizational process. Apart from this, the combination of sensationalist and human drama and heroic sequences could be found in all of the newspapers. Moreover, a somewhat

uncritical attitude could be seen to prevail in terms of the sequences of information put out by the authorities and published with little analysis on the part of the reporters.

Only in the case of the data on fatalities did various newspapers search to delve deeper into the problem. Otherwise, a long series of at times totally contradictory information was reproduced without comment. In this context there were of course the usual examples of the finger slipping on the typewriter producing some out of bounds data. Such is the case for example when one newspaper (La Prensa Libre) reported early on that total losses summed to US \$600 million; in another newspaper the arrival of a Venezuelan plane with 30000 tons of food stuffs was reported; and, in late May, Juan Rafael Lizano was quoted in La República as stating that losses in infrastructure on banana farms and from taxes summed to US\$ 7 billion (twice the size of the national debt!).

The country's principle newspaper "La Nación", an influential component of the national social structure, produced various extremely hard hitting and pertinent lead articles which directly or indirectly seemed to induce major changes in government organization and policy, as we have analysed in the previous sections. Moreover, the newspaper promoted a published investigation into the psychosocial impact of the earthquake amongst children and adults which, apart from the conjunctural conclusions it brought up, highlighted a recurrent theme as regards the manner in which ongoing social conditions precondition psychosocial situations during the conjunctural crisis (La Nación- Demascopio, 1991).

The overall concentration of the press on "problem" oriented aspects of the disaster (deaths, injuries, infrastructural losses, protests, conflicts, organizational difficulties etc.) left the more positive developmental aspects of the disaster basically untouched. The positive role of local population groups, and of a broad range of nongovernmental organizations were essentially absent from the reports. Moreover, in general, the disaster was, for the press, a "two week affair". Following the first week of May, Limon would appear in the press basically on anniversary dates (one month after, six months after etc.). The ongoing disaster and the social and economic problems it involved were not subject to much analysis and comment.

A second area of social communication worthy of comment pertains to the public acceptance and perception of the broad area of scientific information and knowledge, which was diffused in the aftermath of the quake. Little research

has been promoted in this area, but a series of persistent questions as regards the role of scientific information and its relationship to public education were brought to light following the event.

Costa Rica has two independent university based seismological units or networks. The first, based at the National University (OVSICORI, The Vulcanological and Seismological Laboratory) and, the second at the University of Costa Rica in conjunction with the National Electricity Institute (NSN, the National Seismological Network).

Despite attempts at creating a single integrated national network during the 1970's, these two units have basically worked independently with their own group of scientific staff and equipment. Both are, however, linked to the National Emergency Commission on a technical and advisory basis.

The recent history of relations between these two groups has been tinged with conflicts and contradictions which have at times transcended the purely scientific realm and been voiced in legal terms. During periods of major seismic activity the two networks have produced contrasting information on such aspects as epicentre location, and quake intensity and in terms of the hypotheses or theories their principle representatives manage as regards seismic patterns in the country, and on the prognosis of events.

Many of these differences in criteria can, in strictly scientific terms, be seen as positive and necessary aspects of academic or university debate.

However, the aspects dealt with have tended to transcend such a closed sphere and impinge on an arid area of social concern and debate. The infighting which ensued, for instance, around the conflicting information put out during the Puriscal seismic swarm in 1990, led to severe social consternation in the area and even suscitated the national press to comment on the inconvenience of internal divisions and conflicting information from the two networks.

The Limon earthquake served to renew the existing polemic. OVSICORI, which took a more prominent place in the press coverage of the quake, indicated that the shock had a local magnitude of 7.2 on the Richter scale, with an epicentre 39.5 km southwest of Limon at a depth of 21 km. (L.N. April 24, p.12 A). In contrary fashion, the National Seismological Network established a magnitude of 7.4 (consonant with internationally recorded levels) an epicentre some 40 km S.W. of Limon and a depth of 7.4 km (L.N. April 28, p.4a). The differences in magnitude and

epicentre depths reported are of course extremely significant. (La Nacion had olympically announced on April 23 that the quake was due directly to plate submergence and not, as was the case, to the activation of a local fault!).

On a more serious front, as regards possible social repercussions, the quake presented the opportunity to publicly reopen the long standing debate between the two groups as regards seismic patterns in the country and prognostications as regards future events. Thus, OVSICORI, through an attentive press coverage reiterated its hypothesis that the country is at present immersed in a seismic cycle which commenced in 1983, with a large quake off the south Pacific coast, was followed by the Cobano, Puriscal, Alajuela and Limon episodes and will cease sometime between 1993 and 1995 with a large tremor off the Peninsula of Nicoya in N.W. Costa Rica. This type of 10-13 year cycle, with forty year interludes, had occurred twice previously in this century according to OVSICORI, and offers the basis for the ongoing hypothesis.

Professionals linked to the NSN at the University of Costa Rica routinely and regularly reject this hypothesis, denying the possibility of such "predictions" and ascertaining, more cautiously, that the seismic cycles run for around sixteen years, that the present cycle began in 1978 with the Samara quake, was reenergised with the Cobano quake in 1990, and that it is impossible to predict the exact end of the cycle. (See D.E. April 24, p.5; L.N. April 28, p. 10a; L.N. August 19, p.7a; L.N. August 16, p.4a; L.N. August 21 p.18a).

Apart from the differences of opinion regarding scientific aspects of the cycles, clear differences of opinion also emerged as to the convenience or not of publicising predictions such as that produced by OVSICORI. According to an article published in "La Nacion" (August 21, p.18a). Federico Guendell and Carlos Montero of OVSICORI, two of the major proponents of the 10 year cycle hypothesis, justified its public discussion seeing this as a means of warning the population as to the possibilities and the need to be prepared, and not in order to cause alarm.

However, University of Costa Rica specialist Walter Montero head of the School of Geology and member of the NSN, was of the opinion that it was not recommendable to offer such public prognosis under conditions of uncertainty (L.N. August 21, p.18a). This point of view was brought home more forcibly by Montero in the Forum Section of La Nacion on October 4, following an article published by the newspaper on September 20 dealing with a modified (and more

cautious) longer range version of the OVSICORI hypothesis, put forward by a visiting Japanese specialist, Dr. Kunibito Shimazaki. The letter published in Forum, seemed to place the onus of responsibility for diffusing uncertain information squarely on the shoulders of the journalist who wrote the article and not on those of the scientists who posited the theory in the first place. The letter led to a firm reply from the journalist who justified the article in terms of the public responsibility of the press to present such issues when they came from respectable scientific sources (L.N. October 15, p.14a).

Perhaps the major source of the problem suscitated by this debate derives from a combination of two factors.

Firstly, despite the range of excellent research results generated by OVSICORI in the physical field and of direct relevance to the preparation of the population, there has been an over emphasis on the particular cycle theory and this is what has been given most public exposure. In many ways, this reflects the way in which a good part of the geophysical sciences efforts seem to be directed to the jackpot goal of prediction.

Secondly, OVSICORI has always manifested an interest in the field of education and preparation. This derives in part from a more multidisciplinary conformation of it's professional staff (geologists, geophysicists, geographers and behavioural scientists) than is the case with the NSN (predominantly geologists and geophysicists). But, the behavioral sciences side of the equation is clearly more empirical and not as conceptually well founded as the physical sciences aspects, leading to a certain level of voluntarism in the concerns and suggestions as regards preparation and education.

Clearly, the theme of public education and preparation for disasters is of paramount importance and has been spurred by the series of emergencies suffered in Costa Rica over the last three years, and particularly by the Limon quake. The need for an integral approach to preparation, considering current knowledge on the distribution and temporality of physical risk in the country and on numerous significant behavioral aspects of the population is obvious.

The major problem with the polemic between OVSICORI, Montero and the journalist was that to a certain extent all, were correct in their arguments, but the problem was treated in an extremely limited manner, through a medium which, for good or bad, has a major impact on the general public. Moreover, the polemic derived from a single

hypothetical stance as regards the pronostication of a single future event. Thus, the OVSICORI argument that publically discussing the cycle hypothesis is a means of preparing the population was not particularly convincing, given that no one who lives in Costa Rica can be unaware of the probability of earthquakes especially considering the number which have occurred during the last decade. On the contrary, sociological and behavioural science evidence would suggest that putting a relatively fixed "date" on the prognosis is likely to be counterproductive especially if the event never happens, even though you achieve the short term goal of getting people to prepare. More appropriate is the idea of creating a permanent awareness of risk, independently of particular events. After all, Limon was such a problem precisely because it was never pronosticated nor considered a real possibility. Preparing for unexpected events is obviously part of preparing for the expected, especially given the relatively primitive level of earthquake prognostication still existing and the fact that there are still a few odd faults hanging around that nobody has paid too much attention to.

Providing an hypothesis geared up to prediction of a single event, which in itself is not likely to cause a major disaster, given its projected location off the coast relatively distant from major population centres, does not seem to offer the best public awareness and preparation strategy.

The problem of the adequate treatment of behavioural science knowledge was also demonstrated immediately after the Limon quake when the press gave ample coverage to another OVSICORI generated idea relating to the existence of a Post Earthquake Syndrome in the country. The Syndrome, which supposedly affected more than 20% of the country's population supposedly consists of a deep existential crisis, including anguish, mental depression, feelings of insecurity, etc. Apart from the fact that no concrete, systematic empirical evidence could be presented to substantiate such an early evaluation, OVSICORI went a step further suggesting three vaccines to combat the Syndrome: obtaining scientific information about earthquakes; understanding the potential effects of such events; and the development of individual and family emergency plans.

As Aguirre (1991) appropriately commented: "it is obvious that the use of medical models to provide analogies to understand (and, we'd add, combat) the mostly appropriate concerns of the population during the protracted period of seismic activity is unwarranted, especially in the absence of empirical documentation and analysis. Such a

characterization is premature and probably unproductive".

The sum of the issues raised by the OVSICORI-NSN discrepancies both in geographycal and behavioral science terms leave, we believe, a couple of outstanding lessons.

The first is the need to configure a single integrated national seismic network in order to achieve economies of scale in a very small country and eliminate the continuous differences in the public diffusion of information. Steps have been apparently taken in this direction since the Limon quake.

The second aspect relates to the pressing need to promote a true interdisciplinary basis for disaster studies whereby professions from the physical and behavioral sciences mutually interact, reinforcing the technical production geared to prevention and mitigation activities.

The contribution of sociology, psychology, human geography, economics and the administrative and legal sciences cannot be adjuncted haphazardly and empirically onto ongoing physical research. There is a need for integrated efforts whereby, among other things, physical science knowledge is adequately transformed into socially accessible information which suscitates changes in educational and preparedness levels.

6. CONCLUDING REMARKS:

In the present chapter we have sought to highlight and document a wide range of social aspects ensuing from the Limon earthquake.

The limited information base used to sustain our analysis has its own risks, and future advances must be accompanied by research involving in-depth interview schedules with the relevant actors on the disaster scene. However, within the limitations of the method used we are convinced that many outstanding social science questions have been raised and that the range of contexts and problems identified is an adequate reminder of the need for broadly based social research into disasters. Moreover, confirmation is given to the idea that disasters are social animals and that many of the aspects which serve to define a disaster commence once the physical triggering mechanism has passed away.

The analysis presented has included a summary review of aspects related to the short term impact of the quake on population, infrastructure and social welfare; on

segregation in terms of access to aid on a social and territorial basis and on the economic and political conditioning or impact of this process; on logistical and organizational problems and emergent organizational solutions; on the relationship between policies for the recovery and long term development of the Atlantic Region problems of capital flows and the emergence of social movements promoting the improvement of social conditions in the affected areas; and finally, on certain aligid problems of social communication. Emphasis has been given throughout our analysis to the problem of information production and diffusion in the disaster's aftermath.

From our perspective, there can be no doubt that a major part of the characteristics of the disaster and of the problems and solutions which emerged in the nine months following the quake and included in our anylisis, are a product, in good part, of preexisting social, economic, political, institutional and legal vulnerabilities or capabilities. The earthquake served to bring to the surface already existing opportunities and contradictions. Seen in a "social change" context the earthquake renewed the debate and negotiation for more just conditions of development for the forgotten Atlantic Region without however, much having been achieved to date. Moreover, postulated changes in the economic, institutional, organizational and educational milieu for disaster management were clearly suscitated. The future will tell if the opportunity was taken or if, as in many other contexts, a short interlude of potential for change is lost, and things return to an unsatisfactory normality.

BIBLIOGRAPHY.

- 1-Aguirre, B., 1991, Social Aspects of the Costa Rica Earthquake of April 22nd 1991. Mimeo.
- 2- Comisión Especial de Vivienda, Dirección de Planificación y Control., 1991, Resumen General: Emergencias, Sismos e Inundaciones, Mimeo, Setiembre.
- 3- Comisión Nacional de Emergencias, Dirección de Prevención y Mitigación, (Vanessa Robles)., 1991, Informe de Pérdidas en Infraestructura Terremoto del 22 de abril de 1991, Provincia de Limón, Mimeo., 15p.
- 4- Comisión Nacional de Emergencias, Dirección de Prevención y Mitigación, (Vanessa Robles)., 1991, Pérdidas en Infraestructura Limón Inundaciones Agosto, 1991. Mimeo 17p, Tables and diagrammes.
- 5- EQE.International., 1991, The April 22, 1991 Valle de la Estrella Costa Rica Earthquake: A Quick look Report. EQE International, San Francisco, 38p.
- 6- Kreps G., 1984, Sociological Inquiry and Disaster Research, Annual Review of Sociology, 10. 309-330pp.
- 7- La Nación/ Demascopia, 1991, Secuelas del Terremoto: Efectos Psicológicos en la Población de Limón, Mimeo, 32p.
- 8- Lavell, A, Arroyo N, and Madrigal, P., 1991, Informe Ejecutivo: Conclusiones y Recomendaciones: Proyecto de Desastres Naturales y Zonas de Riesgo en Centroamérica: Condicionantes y Opciones de Prevención y Mitigación, Consejo Superior Universitario Centroamericano, Escuela de Ciencias Geográficas de la Universidad Nacional de Heredia (UNA), International Development Research Centre, Canadá Mimeo, San José.
- 9- Madrigal, P., 1991, Costa Rica: Marco Institucional, Legislación, Estrategias, Políticas e Instrumentos para la Prevención, Mitigación y Atención de Desastres. Proyecto: de Desastres Naturales y Zonas de Riesgo en Centroamérica: Condicionantes y Opciones de Prevención y Mitigación, Consejo Superior Universitario Centroamericano, Escuela de Ciencias Geográficas de la Universidad Nacional (UNA), International Development Research Centre, Canadá Mimeo, San José.
- 10- Mendez Antillon, B., 1991, Limon (Costa Rica) Earthquake of April 22, 1991. Comisión Nacional de Emergencias. Mimeo. San José.
- 11- Pelanda, C., 1981, Disaster and Sociosystemic Vulnerability, Preliminary Paper 68, Columbus, Ohio, Disaster Research Centre. The Ohio State University.

12- Guarentelli, E., 1987, What should we Study? Questions and Suggestions for Researchers about the Concept of Disaster, Mass Emergencies and Disasters, March, vol 5, No1.

13- Valverde, J; Vargas, J; and Lavell, A., 1987, Elementos teórico-metodológicos para el análisis de movimientos sociales regionales, Revista de Ciencias Sociales, Universidad de Costa Rica, No 37-38, setiembre, San José.