Community and Disasters in Latin America: Strategies for Intervention

Summary

The main argument in this document is that many disaster prevention models as currently applied in Latin America have fundamental conceptual and methodological flaws. These models are based on a formal but inappropriate conception of vulnerability and disasters, from which a series of conventional disaster prevention and management instruments are derived.

It is proposed here that due to the economic and spatial processes that have occurred in Latin America over the last twenty years, local vulnerability scenarios are increasingly heterogeneous and undergoing rapid change. Consequently, there is a growing divorce between the instruments and interventions which arise from this formal conception and local people's own conceptions of vulnerability and disaster. This divorce is the basic cause of the irrelevance or failure of many disaster prevention programs in the region.

It is recommended that disaster prevention programs should be re designed on the basis of people's own conceptions of vulnerability and flexible strategies for intervention appropriate to local conditions. The implementation of such strategies in turn implies making profound changes in the institutional framework within which disaster prevention is implemented in the region, making that framework more decentralized, popular and realistic.

Disasters in Latin America

The Social and Economic Impact of Disasters

Despite economic growth, disasters, normally associated with different types of geological or hydro-meteorological hazards (earthquakes, volcanic eruptions, hurricanes, tropical storms, floods, mud flows and droughts), are still critical problems in the development of regional economies and urban centers in Latin America. For example, in 1993 even relatively developed cities, such as Santiago in Chile and Caracas in Venezuela, experienced significant disasters that caused a considerable number of deaths. The Brecht tropical storm caused some 100 deaths in Caracas in August 1993, while mud flows killed 22 people and caused a great deal of material damage in an area close to the city center of Santiago in May 1993. Symptomatically, these two disasters revealed that disaster prevention has still not been successfully incorporated into development plans, even in those countries in Latin America which apparently have the resources necessary to do so.

As stated by Venezuelan author Arturo Uslar Pietri:

"Among other things, the recent, fairly moderate tropical storm that hit Caracas has revealed all the negative aspects of the human settlements that have spread around the city beyond the urban areas, invading hills and gorges with an anarchical and cancerous proliferation of unstable dwellings and random buildings, covering the entire physical area as far as the sea shore and neighboring valleys".

According to information collated by the Pan American Health Organization (Zevallos 1989) which analyzes the period between 1985 and 1988, disasters affected approximately 3.7 million people in the region. However, without doubting the credibility of the source, the figures probably do not reflect the full magnitude or dimension of the problem.

In the first place, numerous small disasters constantly occur throughout the region and which do not receive international aid. It is unlikely that all of these are properly reflected in PAHO's figures. In fact it is possible that the cumulative impact of these small disasters may be as great as that of those large scale catastrophes which are publicized by the mass media and reflected in international statistics.

Secondly, as shown in a recent study (Maskrey and Lavell 1993), the real impact of a disaster cannot be accurately modeled simply by the number of casualties. In the disasters which occurred in Alto Mayo, Peru, and Limón, Costa Rica in 1990 and 1991, there were relatively few casualties because of the low population density. Nevertheless, the disruption caused by both disasters in the respective regional economies was quite considerable.

Thirdly, as was evident in the Alto Mayo and Limón disasters as well as in other cases such as the reconstruction of Popayán, Colombia after the 1983 earthquake (Wilches-Chaux, 1989), it is very difficult to determine the limits between the effects of a disastrous event *per se* and the *normally disastrous* circumstances of the society in which the event occurs. Wilches-Chaux asked the question "how can we differentiate between the victims of a disaster and the victims of everyday life?" This is not just a conceptual question but a practical one faced by emergency managers each time a disaster occurs. While disasters continue to occur, the boundaries between

these events and everyday life in Laun America become increasingly fuzzy and ambiguous.

It is also essential to examine the economic impact of disasters in the region. The destruction of productive infrastructure such as highways and railways, hydroelectric plants, drinking water supplies and others, has a double impact. On the one hand, the loss of costly investments in a region where the lack of capital is a permanent problem and in which existing facilities are normally deficient. The replacement of destroyed infrastructure implies the use of resources that could have been applied to new investments in economic and social development. On the other hand, the destruction of productive infrastructure curtails economic activities in general, affecting people's income and employment levels. Losing a job as a result of a disaster can be just as serious as losing a home, if not more so.

The 1987 earthquake in Ecuador caused economic losses estimated at over US$ 890 million, due to the rupture of an oil pipeline and the resulting paralysis of production. In March and April 1993, Ecuador's economic vulnerability was again highlighted by the Josefina landslides, which while only causing 35 deaths implied economic losses of US$ 150 million, besides threatening to destroy a hydroelectric power plant which supplies approximately 70% of the countries electricity (Cruz, 1993).

It is also necessary to draw attention to the fact that disasters in the region are not only associated with so-called natural hazards, but also with technological and industrial hazards, as demonstrated by the explosions that occurred in Guadalajara, Mexico in 1992 (Macías 1992).

While this paper does not pretend to provide a rigorous analysis of the social and economic impact of disasters in the region, the examples mentioned do show that, as stated by the Network for Social Studies in Disaster Prevention in Latin America (La Red 1993), we must *"define the problem of disasters as an unresolved development problem"*. In other words, disaster risk has not been reduced as a consequence of the development models applied in Latin America; but on the contrary has not disappeared and may even have increased.

The Social and Territorial Distribution of Disasters

Apparently therefore, the social and economic impact of disasters in the region is still on the increase. In order to validate this hypothesis, longitudinal studies of the historical impact of disasters in given geographical regions would be required, and, in general, this sort of research has never been undertaken. Nevertheless, the evidence from different contexts does serve to underline the sort of general trends which are occurring.

In Lima, a large metropolis with a current population of approximately 8 million people, it is not difficult to demonstrate that the impact of a strong earthquake in the 1990s would be far greater than that of the major 1940 earthquake, at a time when the city had only 400,000 inhabitants. According to a study carried out in 1982, *"in the earthquake of 24th May 1940 179 people were killed and 3,500 injured in the city of Lima. In contrast, the present study shows that, hypothetically, if an earthquake of exactly the same characteristics were to occur today, 17,882 dwellings housing 84,000 people in just a few critical areas of the city would suffer over 75% damage - equivalent to virtual destruction"* (Maskrey and Romero 1985).

On a global level, it was stated in an influential book (Wijman and Timberlake 1984) that the number of people affected by floods, cyclones,

earthquakes and droughts had increased from 27 million people during the nineteen sixties to 48.3 million during the seventies, without any evidence of significant climatic or geological changes.

Similarly, in research work carried out following the major disasters that occurred in 1970 in Ancash, Peru (Oliver-Smith 1986) and in 1983 in Piura, Peru (Franco 1992), it was shown how vulnerability to disaster evolves historically due to the development models adopted or imposed.

Apart from an overall increase in their impact disasters are also characterized by a widely variable and unequal social and territorial distribution. The impact of disasters is generally greater in less developed countries, and the tendency within these countries is for the impact to be concentrated amongst the poor. Again while this is an acceptable statement in very general terms, there is very little empirical information to prove it categorically.

For example, it is claimed that between 1960 and 1981, Japan was affected by 43 disasters in which a total of 2,700 people lost their lives, which is equivalent to 63 deaths during each disaster. On the other hand, in Peru during the same period there were 31 disasters, causing a total of 90,000 deaths, which is equivalent to 2,900 deaths in each disaster (Wijman and Timberlake 1984). Without doubting the accuracy of these figures, it should be pointed out that in the Peruvian case, nearly half of the deaths occurred in a single event, i.e. the 1970 disaster in Ancash, the worst catastrophe to have occurred in the western hemisphere so far. The only detailed empirical information available on the social and territorial impact of disasters in Latin America is to be found in case studies of particular regions (Caputo, Hardoy, Herzer 1985; Lavell 1991). While these do not provide a comparative analysis based on common criteria, they do provide concrete evidence that in different contexts, disasters have a widely differential territorial and social impact.

To summarize, despite the lack of consistent comparative research, there is already sufficient evidence in specific case studies to show that: disasters have a serious social and economic impact on regional economies and urban centers; their impact is increasing with time and that it is concentrated differentially both in territorial as well as in social terms.

Patterns of Disaster Vulnerability in Latin America

Conceptual Vulnerability Models

It is impossible, within the context of this document, to cover in any depth the large body of literature dealing with vulnerability that has been written over the last decade. However, it is possible to demonstrate a clear relationship between the build-up of vulnerability to disasters in Latin America and processes of political economic change, and that spatial and temporal vulnerability patterns are changing, as a result of the transformation of economic policies.

Gilbert White and his colleagues in the United States (White 1974) were the first to claim explicitly that disasters are not synonymous with natural hazards. White maintained (without using the same terminology) that the risk of suffering a disaster depended not only on the magnitude of the

natural hazard but also on the vulnerability of the society exposed to it. This led to the following widely accepted formula:

Risk = Vulnerability * Hazard

The importance of White's work should not be underestimated because until a few decades ago, it was considered that the magnitude of a disaster was directly and solely related to the magnitude of the hazard. However, since then not one but several differing interpretations of vulnerability have arisen.

The conceptual model of vulnerability found in documents produced by UNDRO (UNDRO 1979) and others, used the vulnerability concept to measure the degree of exposure to a natural hazard. In other words, vulnerability was considered as a direct relationship between disaster risk and hazard. This model implicitly assumed that the societies exposed to hazards were homogeneous, except as far as their degree of exposure was concerned. Hazard was considered to be the active and vulnerability the passive factor in this model.

During the last decade, however, this rather limited model of vulnerability has been challenged and expanded. A number of researchers (Hewitt 1983; Maskrey 1984 and 1989; Wilches-Chaux 1989; Cannon 1991, to name but a few), have further developed the concept of vulnerability. Their work seeks to explain why society becomes vulnerable to hazards, by analyzing the causal economic, social and political processes. Vulnerability (expressed as a characteristic of a given political-economy) then becomes an active factor in the disaster formula. This revised conceptual model of vulnerability is summarized by Cannon as follows:

"[...] there are particular characteristics of different groups of people (derived from economic, social and political processes) which mean that with the impact of a particular type of hazard of a give intensity, some avoid disasters and others do not. The processes which make people more or less vulnerable are largely (but not exactly) the same as those which generate differences in wealth, control over resources, and power, both nationally and internationally. The vulnerability concept is a means of 'translating' known everyday processes of the economic and political separation of people into a more specific identification of those who may be at risk in hazardous environments." (Cannon 1993:95).

People's inability to absorb the impact of hazards or sudden changes and to recover from them, can stem from a number of vulnerable conditions, such as: unsafe housing; the location of settlements in hazard prone areas; low income which is insufficient to cover even basic necessities; non-existent or precarious levels of material assets and reserves; reduced biodiversity or non-existent or inadequate social protection measures at community or society level. Vulnerable conditions such as these emerge through the operation of different social, economic and political mechanisms, such as: regional, social, ethnic and gender inequalities within a society; the operation of land and real estate markets, and certain kinds of political decision-making mechanisms, to name but a few. In turn, these mechanisms characterize broader processes of change such as: urbanization; problems of over accumulation and indebtedness in national, regional and the international economies as well as different kinds of wars and conflicts.

Cannon perhaps under emphasizes, however, the existence of different kinds of iterative relationship between vulnerability and the magnitude and intensity of hazards themselves (Maskrey 1984; Lavell 1991). Certain patterns of land occupation and use lead to the degradation of soil, water and vegetation in vulnerable areas, amplifying the magnitude and intensity of droughts, floods, mud flows and other hydro-meteorological hazards. On a global level there is an increasing concern about the impact of the greenhouse effect on the climate, and the dissipation of the ozone layer. Vulnerability, as a concept, therefore, is increasingly central to explaining not only disaster risk, but, often enough the magnitude and intensity of hazards as well.

Relating vulnerability to disaster impact in Latin America, it can be argued that it is the different economic, political and social processes operating in the region that are generating vulnerability patterns which in turn create increasingly propitious conditions for disaster occurrence.

The Spatial Accumulation of Vulnerabilities

If this is so, when changes occur in the direction of economic, political and social processes, changes in vulnerability patterns are bound to take place. The political-economy of many countries in the region has changed dramatically over the past twenty years and this change must have had significant consequences on spatial and temporal vulnerability patterns. The different accumulation regimes and modes of regulation (Aglietta 1979) are characterized by different patterns of spatial organization and therefore, different patterns of vulnerability accumulation.

The implanting of the accumulation regime and mode of regulation generally referred to as "peripheral Fordism-Keynesianism" in Latin America after the Second World War (Harvey 1985), was not accompanied by a long period of stability and economic and social growth - as was the case in the industrialized countries - nor by a relatively stable spatial organization of production based on long term investments in rigid fixed capital. In Latin America, stability was only achieved for far shorter periods and was restricted to a number of modernized enclaves. In the region, peripheral Fordism-Keynesianism led, in general terms to an explosive growth of large cities and the disorganization of rural economies. This period was characterized above all by a spatial accumulation of vulnerabilities in cities, particularly in large metropolitan areas. The rapid growth of urban fringe settlements in all Latin American cities, with precarious housing built on land often highly susceptible to different hazards, coupled with industry's inability to generate a sustained economic growth capable of covering basic urban needs, were key factors that led to this concentration of vulnerabilities.

By the seventies, cities like Lima had become very vulnerable, with a limited capacity for either absorbing the impact of hazards or recovering from them (Maskrey and Romero 1985). It is safe to say that most major urban disasters during the seventies and eighties (Guatemala 1976, Managua 1972, Mexico 1985, etc.) were caused by a spatial concentration of vulnerabilities in major cities resulting from the direction of the political-economy during that period.

The radical changes that have taken place in the region's political economy since the seventies may have led to new changes in the spatial accumulation of vulnerability. The growth of small and intermediate cities, the incorporation of new territorial regions in domestic and international markets and the expansion of informal productive sectors based on small-scale enterprises, accompanied by new migration and population

distribution patterns, are only a few of the mechanisms and processes that have led to this change in vulnerability patterns.

The occurrence of disasters such as those of 1990 and 1991 in Peru and Costa Rica (Maskrey and Lavell 1993), provides new empirical evidence of this process of change. While the process as such has not been adequately analyzed and defined, there is no doubt that significant changes have taken place in the spatial distribution of vulnerability over the last twenty years. In Latin America's peripheral regions in particular, there is evidence of a rapidly increasing accumulation of vulnerabilities which will almost certainly lead to new patterns of disaster in the future.

The Temporal Accumulation of Vulnerabilities

The main difference between peripheral Fordism-Keynesianism and flexible accumulation -as the present accumulation regime is generally referred to- is the acceleration and increasingly unpredictable character of economic, territorial and social changes. With the (in itself uneven) move from one accumulation regime to another change is increasingly characterized by speed and turmoil. This can be described as a change in the nature of time and which is having major repercussions in the accumulation of vulnerabilities in Latin America. It can be argued that vulnerability accumulation generally takes place historically during periods when rapid, violent or unstable changes occur in the political economy. This relationship between the nature of change and vulnerability has not been adequately dealt with in the bibliography on disasters. The concept of violent and unpredictable change is used almost exclusively with reference to the occurrence of hazards. However, violent changes or "shocks" in the political economy of a region, are at least as important in terms of explaining the occurrence of disasters.

It is not difficult to identify the reasons why vulnerability accumulates during periods of turmoil and violent change in the political economy. Many hazards, such as earthquakes, occur infrequently over long periods. The ability to incorporate them as a variable in decision-making at all levels, is at least partly dependent on their periodicity. Under stable political and economic conditions when decisions are taken regarding land use, building or productive investments in a twenty, thirty or more year time frame, decision makers may well incorporate information on hazards as a variable in their decisions, providing of course that this information exists and is available. In contrast, when this decision making time frame is heavily compressed or starts to violently oscillate, decisions must be made in highly uncertain and unstable conditions. In these conditions, even when information on hazards is available it is unlikely to be taken into account by the decision maker particularly in the case of infrequent hazards with a long periodicity. Vulnerability can also be defined as the inability to incorporate hazard occurrence into decision-making. The accumulation of vulnerabilities is therefore closely linked to the phenomena of time compression and turbulence.

It is worth examining in more detail how time compression and turbulence affects people's decisions and how this accelerates vulnerability. In peripheral regions such as the Alto Mayo in Perú (Maskrey and Lavell 1993), the time frame in which farmers make decisions on land use and cropping patterns has been reduced to a minimum. Impoverished small holders, for example, are under pressure to deforest unstable slopes in order to grow coca for foreign markets: the only crop which has a guaranteed return in a very short time frame. In a context of increasing market turbulence, accelerating the turn over time of their capital, is a risk

mitigating and survival strategy. The wider effects of deforestation, which include increased vulnerability to floods and droughts, occur however over a much longer time frame and therefore are not accounted for in the small holders decision making process. The small holder knows that it is unlikely that this increased vulnerability will become manifest in a space of one or two years, sufficient time for him to turn over his capital and move on to a new area, or to produce a new crop for a new market. In other words, the need to accelerate turn over time in the face of increasingly unstable markets virtually eliminates the possibility that local people can adapt over time to hazards be these slow impact ones such as erosion or sudden impact ones like earthquakes.

To put this into a historical perspective, the work of Engels on the life of the British urban working class during the mid-XIX century (Engels 1845), showed a similar accumulation of vulnerabilities in rapidly growing industrial cities, during another period of violent time compression, this time brought about by the change over from craft to industrial production. In contrast, vulnerability in the same cities rapidly decreased in the retarded stability of the Fordist-Keynesian period (1945-1973), the period characterized by public health legislation, improved housing and the welfare state.

Taking into account these facets of time compression and turbulence, which now seem to characterize the political economy of Latin America, vulnerability is much less rigid in spatial, social and economic terms than it was twenty or so years ago and is therefore much less predictable. Due to time compression, communities can no longer in slow motion adapt their living patterns and economies to deal with hazards. At the same time vulnerability itself becomes more fleeting, less objective and more difficult to define.

Conceptions of Disaster

There is not just one objective interpretation of time and space, but rather many interpretations with very significant imaginary and cognitive contents. Cities, regions and towns are not just physical but also imaginary physical spaces (Silva 1991) where the subjective time-space experience of different people, social and cultural groups is all important. If the fragmentation of time and space produces vulnerability scenarios which are rapidly changing and increasingly complex and dispersed, then this at the same time needs to be concatenated with equally fragmented social and cultural conceptions of vulnerability and disaster. Different social and cultural groups process different conceptions of vulnerability and disaster, based on different experiences and interpretations of time and space. Rather than refer to disaster as a homogeneous phenomena or vulnerability as an objective condition which can be measured, any one disastrous event is in reality many different disasters encompassing many different vulnerabilities, depending on the conception and viewpoint of the experiencing subject.

In this respect, it is worth remembering that it was only in the XV century that common (in terms of being socially accepted) criteria for measuring time and space took root. The development of the rules of perspective by Brunelleschi and Alberti, provided the first opportunity to view the world from a cold, distant and apparently objective viewpoint, while the introduction of the chronometer made it possible to regard time in the same way. Pre-Cartesian perceptions of time and space were replaced by a conception that at least aspired to a veneer of objectivity. Nevertheless, at the same time as autochtonous visions of time and space gradually gave

way to the rules of perspective and chronometer time. this conception was in turn fragmented by the implosion of space and the acceleration of time into new mutations, which no longer corresponded to pre-modern perceptions but to an increasingly complex and ephemeral superposition of different time-space rhythms.

In the same way as the homogenization of time and space through maps and the clock contrasts with different social and cultural perceptions of time and space, the apparently objective conception of disaster developed by the natural and engineering sciences contrasts with the multiple conceptions of disaster managed by different social and cultural groups. In Latin America the pre-modern and autochtonous conceptions of pre-hispanic people disappear, giving way to new, more complex interpretations in which pre-modern, modern and post-modern coexist as intersecting planes. It is vitally important to understand and analyze these conceptions in order to understand people's behavior and decision-making when faced with risk. Crucially, there is a fundamental clash between the formal conception of disaster from a conventional scientific and technological perspective and people's own multidimensional interpretations. Unfortunately, the former generally neither acknowledges, respects nor listens to the latter.

Disaster Prevention in Latin America

The Institutional Framework for Disaster Prevention

For the purposes of this paper, we shall use the term disaster prevention to refer to all those activities aimed at minimizing the destructive and disruptive effects of disasters. The term will be used generically to include specific activities often referred to as preparation, mitigation, reconstruction or disaster management. Disaster prevention can include physical measures such as the strengthening or reconstruction of dwellings or the relocation of settlements; legal measures such as building or land use zoning norms and standards; training and education, institutional reform and others. It can take place before, during or after a disaster occurs.

There is a serious lack of research in the region evaluating the evolution of disaster prevention and management, the institutional framework used and its impact, which in turn could give rise to a review and evaluation of achievements, failures, strengths and weaknesses. As previously mentioned, only case studies are available (Caputo, Hardoy and Herzer 1985; Maskrey 1989; Lavell 1991; Medina and Romero 1992,), as well as a few longitudinal studies on specific disasters (Oliver-Smith 1986), mostly carried out by foreign researchers and rarely published in the region. However, on the limited basis of these materials different kinds of institutional actor can be identified:

- Permanent official organizations responsible for coordinating disaster prevention activities, for example the National Civil Defense Institute in Peru, the National Disaster Prevention and Attention Office in Colombia, the National Emergency Commission in Costa Rica, etc.
- Ad-hoc official organizations created to manage reconstruction processes after major disasters, e.g. CRYRZA (Committee for the Reconstruction and Rehabilitation of the Affected Area), created by the Peruvian government for coordinating reconstruction work after the 1970 earthquake in Ancash, or the IOCS programs (Anti-Drought

Works Inspectorate) that were put into practice within the context of the severe droughts that affected the north east of Brazil (Pessoa 1985).

- International training and technical assistance programs applied by bilateral and multilateral agencies, e.g. the Natural Hazard Risk Assessment and Disaster Mitigation Pilot Project implemented by the Organization of American States, (OAS) which has carried out activities in twenty member States in Latin America and the Caribbean (Bender 1989), or the Emergency Preparedness and Disaster Relief Coordination Program implemented by the Pan American Health Organization (PAHO) (Zevallos 1989).
- Specialized scientific and technological research institutions, e.g. the Regional Seismological Center for South America (CERESIS).
- National and international NGOs and local governments, which according to well-documented studies (Maskrey 1989; Medina and Romero 1992) have fulfilled a fundamental role in disaster prevention, particularly in reconstruction programs after disasters in several countries (Peru, Ecuador, Guatemala, El Salvador).

In general terms, disaster prevention activities in the region are still heavily concentrated in the field of emergency preparedness and assistance. Next in importance are post-disaster reconstruction programs and projects. Activities to reduce pre-disaster vulnerability and risk are still very incipient.

According to the World Bank (Kreimer and Zador 1989), more progress has been made in Latin America than in other regions in terms of adopting an integrated approach to disaster prevention, particularly in terms of risk evaluation and adopting preventive measures. Nevertheless, according to the Network for Social Studies on Disaster Prevention in Latin America:

"Both research and field projects, intended to reduce vulnerability to disaster, have been dominated by the natural and engineering sciences. Disaster prevention, management and reconstruction projects based on social analysis and incorporating non-structural measures, are still scarce and as yet unconsolidated. Methods of research and application which incorporate the social, natural and engineering sciences are even less well developed" . (La Red 1993).

Despite considerable progress in scientific and technological research, disaster risk and vulnerability in Latin America has not disappeared. In fact, some research studies (Maskrey 1989) indicate that many disaster prevention programs do not achieve the expected results and, in some cases, may be counterproductive, actually increasing vulnerability and risk. It is likely, therefore, that there are still unresolved conceptual and methodological problems in the approach adopted by many disaster prevention programs and projects in the region: problems which need to be taken very seriously in coming years.

Disaster Prevention Programs in Latin America

The recent study on the disasters in the Alto Mayo, Peru, and Limón, Costa Rica, (Maskrey and Lavell 1993) indicates three inter-related problems that seem to characterize disaster prevention programs in Latin America. Based on this study and on other cases (Maskrey 1989), these problems can be defined in the following terms:

The Political-Economy of Center-Periphery Relationships

Disaster prevention programs are usually marked by the indelible stamp of the historical political-economic relations that exist before a disaster occurs. Normally, vulnerable people are peripheral to centers of political and economic power (understanding the center-periphery relationship as a complex gradient made up of different social, economic, spatial, political and cultural factors). If the relationship between center and periphery is characterized by conflict or by marginalization before a disaster takes place, then the same characteristics are bound to manifest themselves in some form or another in any disaster prevention program, which is undertaken.

Disaster prevention programs, therefore, tend to reproduce existing political-economic relationships rather than change them. The political context at the time a program is implemented, the objetives of grass roots organizations and the political interests of different actors, including international aid, are all factors that influence these programs. Sometimes, (Caputo, Hardoy and Herzer 1985; Maskrey 1989) programs have helped to maintain the status quo of vulnerability existing before a disaster, on other occasions even increasing vulnerability. During the Alto Mayo disasters, it took a second earthquake to stimulate an official reconstruction program, which concentrated on repairing water and sewage facilities and implementing a housing program for higher income families. In Limón, official reconstruction efforts were mainly concentrated on the rehabilitation of the infrastructure for the banana industry and port facilities in the area. In general, programs were socially concentrated on higher-income sectors, and territorially on urban areas, neglecting the countryside and non-strategic productive sectors.

The State-Civil Society Relationship

A second problem, related to the above, is that disaster prevention programs tend to rely excessively on formal political representation. The world of laws and decrees, official organization charts and protocol, does not facilitate vulnerable people's participation. In general, there is no institutional framework (either operational or even merely enunciative) for disaster prevention in which all "formal" and "informal" social actors can participate. The lack of channels for participation of vulnerable people and their organizations affected by disasters generally gives way to institutional chaos. This happened not only in the Alto Mayo and Limón disasters, but in many other cases as well (Maskrey, 1989).

Lack of clarity and contradictions with respect to the responsibilities of different levels and sectors of government; the fact that many governments lack real presence in those regions and areas where disasters occur; the weakness of local government; the lack of formal recognition of grass roots organizations and the absence of an institutional framework in which other actors such as NGOs and churches can participate are all factors which lead to institutional chaos and disintegration: a situation in which everyones efforts lose efficiency and effectiveness and the limited resources available are squandered.

There are normally no communication channels through which the needs and priorities of vulnerable people and their organizations can be transformed into appropriate projects and programs supported by different exogenous agencies. As a result, aid is more often than not provided to people that do not require it and programs become uneconomical and difficult to implement, making it difficult to achieve stated goals.

While many plans are produced (either for emergencies, reconstruction, mitigation or preparedness), planning as such is relatively rare. By definition, planning is a particular kind of decision-making process. With respect to disaster prevention, planning almost inevitably deals with questions such as land use and resource allocation. In contexts where many real decisions on these issues are taken directly by people and their organizations, and where there are no channels for their participation in formal plans, then inevitably their actions and those of government and other agencies set off on divergent paths, making any real planning as such completely unviable.

Diverging Conceptions of Disaster

Closely related to the above issues is a third problem: the divergence of formal conceptions of vulnerability and disaster, which are generally incorporated *a priori* into disaster prevention programs and projects and local peoples own multiple conceptions.

Government and international cooperation agencies and many of the NGOs involved in disaster prevention and management, are normally located far from where disasters happen, in social and cultural but not necessarily spatial terms. When, in addition, the regions where disasters occur are experiencing very rapid change, it is unsurprising that most exogenous agencies lack detailed and up-to-date knowledge of these contexts. The evidence shows that there is an inverse relationship between the effectiveness and efficiency of the disaster prevention activities undertaken by exogenous agencies and the location (social, cultural, spatial, temporal) of these agencies with respect to the regions where disasters occur. Often enough, disaster prevention programs treat community vulnerability as if it were homogeneous, on the basis of exogenous interpretations, already made obsolete by the dynamics of these very heterogeneous realities. In the cases analyzed by Maskrey (Maskrey 1989), many programs failed precisely through the application of standardized solutions to highly diverse realities with widely varying needs.

This lack of detailed knowledge of the realities and rationalities of vulnerable communities, means that disaster prevention programs often acquire unreal and hallucinatory characteristics. A sensible and appropriate response to local needs is often replaced by a display of cinematographic "special effects" borrowed from the *a priori* formal conception of vulnerability and disaster. Apparently irreproachable solutions from a formal technical and scientific point of view, clash with people's own multiple conceptions of those same solutions in a process in which technical rationality becomes not only irrational but at times contradictory and even aggressive.

Because of this, despite the collection of "objective" data on the social and economic conditions of vulnerable people, it is difficult to incorporate the complexity of people's own perceptions and conceptions, strategies and decisions into disaster prevention and management programs. A relocation may seem *objectively* desirable from the point of view of a formal technical conception of vulnerability, in order to reduce a villages landslide risk, for example, while at the same time being totally undesirable from the point of view of people themselves, who may see relocation as negatively affecting their livelihoods and access to services. Building earthquake-resistant dwellings with a given technology may be fully justified technically in the *formal conception*, but may be rejected by people because the house type may be culturally unacceptable. Research on housing reconstruction programs after major disasters in Peru (Monzón and Oliden 1989) showed that only in very few cases had the building technology introduced by exogenous agencies been successfully appropriated and adopted by local people.

The organization, philosophy and structure of many disaster prevention agencies is similarly based on these formal conceptions of disaster. In the formal conception, disaster prevention becomes synonymous with emergency response and this in turn with food supplies, rescue equipment, international aid and other elements, with familiar connotations. Because of this, there is such an exaggerated emphasis on emergency response within the overall disaster prevention field.

Another characteristic of these formal conceptions of disaster is the arbitrary division of disasters into structured phases: Emergency, Recuperation, Reconstruction etc. These structured phases, however, rarely correspond to the real characteristics of any disaster. Instead of clearly identifiable emergency and reconstruction phases, the emergency and reconstruction activities of different actors, in different areas, are usually superimposed. Seen from another perspective, each family and community suffers its own disaster, with enormous variations between community and community and between individual families within a community. Some families may be still suffering an emergency while others are already rebuilding. In addition, in countries, regions and communities where emergency is a normal characteristic of day-to day survival, it is extremely difficult to differentiate between the effects of this day-to day emergency and the specific emergency caused by hazard impact. Land invasions by long term homeless families a few days after the Alto Mayo disaster, or the houses in Limón destroyed deliberately by their owners in order to obtain aid from reconstruction programs (Maskrey and Lavell 1993) are eloquent examples of the limits of these formal conceptions in real disasters.

Mass media contribute decisively to the general acceptance and hegemony of the formal conceptions. They exercise enormous influence on the decisions taken by international cooperation agencies, in response to disasters, through projecting often exaggerated and sensationalist images. They also exercise political pressure on government agencies, which play out the role which in these formal conception is expected of them.

Formal and Peoples Conceptions of Disaster: Conceptualizing the Clash

The clash between the formal interpretation of exogenous agencies and the multiple real interpretations of vulnerable people, within the context of the center-periphery relationship in political-economic terms and the State-civil society relationship in social-institutional terms, gives rise to programs, which should be described less in terms of relative successes and total failures and rather as an uninterrupted succession of paradoxical situations and unexpected results (Maskrey 1992). It is these results and situations which tend to confuse those responsible for program implementation and evaluation.

As far as most exogenous agencies are concerned, disaster prevention and the formal interpretation on which it is based, is an eminently instrumental activity, spontaneously understood to be autonomous, self-sufficient and significant in itself. From the viewpoint of formal conceptions, this instrumental activity is justified solely by its technical effectiveness in reducing risk. Technical efficiency tends to subordinate any other consideration and disaster prevention is conceived as a closed instrumental system, far removed from the relationships between human beings, social groups and economic and political power centers, and indifferent to the culture, values or aesthetics of the vulnerable people involved.

Reality, however, is not that simple. Given that there is no single conception of disaster, there can be no single criterion of efficiency. As far as vulnerable people are concerned, disaster prevention is charged with meanings considered from the viewpoint of formal conceptions to be extra-technological. People's vulnerability is immersed in a far broader universe characterized by their own perception and organization of time and space and as a real experiential process.

In other words, disaster prevention programs, implemented by exogenous agencies, are much more than a series of technical measures, which can be judged according to formal conceptions of disaster in terms of efficiency. They are also characterized of a series of extra-technological values and connotations, which have to fit in with peoples own real conceptions of disaster. When a program finds no way of accommodating those values, within peoples own conceptions, then it will either be rejected or abandoned. If it is integrated, a new mutation is produced, both in the program itself as well as in people's own conceptions.

The limited success of many disaster prevention and management programs is therefore due to a basic conceptual problem: the fact that the formal conceptions sustaining them are considered objective, and the fact that the validity of the multiple conceptions of the vulnerable population are not recognized. As far as many exogenous agencies are concerned, the failure of their programs is due to instrumental reasons: the lack of training; poor management of the program; lack of efficiency, etc. For people themselves, on the other hand, failure is more often than not due to economic or political factors or to questions of culture, values or aesthetics.

Towards a Viable Alternative for Disaster Prevention in Latin America

Re conceptualizing disaster prevention

The different problems encountered when formal scientific and technological know-how is applied to disaster prevention, have been reviewed above. In our opinion, those responsible for disaster prevention and management programs are aware of these problems. However, they mistakenly view the problem in terms of the lack of communication, management and training instruments to enable their formal scientific and technological proposals to reach vulnerable people. In reality, the problem is the other way round: there has been little or no effort to develop scientific and technological instruments based on people's own conceptions of disaster.

This re-conceptualization of the problem means that there can be no single disaster prevention model, but rather many different models appropriate to the diversity of specific contexts. Methodologically, therefore, the first step is to identify analytical tools which can enable us to decipher the specifics of real vulnerabilities, allowing a more precise identification of the different variables which together represent the '*inability to absorb the impact or recover from the effects of hazards*'.

Deconstructing vulnerability as an analytical category into a range of different variables and elements, it may be possible to reassemble a typology of vulnerabilities, which more adequately reflect the heterogeneity of real disasters, and which can become a basis for developing more realistic and effective disaster prevention strategies. Understanding vulnerability is fundamental to understanding the real potential for disaster prevention in any community.

A Typology of Vulnerabilities and Potentials for Disaster Prevention

Economic Variables

Although poverty is not necessarily synonymous with vulnerability, it is evident that the non-existence of basic material conditions is fundamentally related to vulnerability. The vulnerability of a family or community depends to a large extent on whether or not they have access to the resources required to satisfy their basic needs and will influence, among other things whether they have to live in hazard prone areas or whether their houses are safely built. At the same time, disaster prevention measures also depend on having access to at least a minimum of resources. Families whose basic needs are not satisfied and who live in a state of extreme poverty are most likely to be vulnerable and least able to carry out any sort of disaster prevention.

Whether people have or not access to resources is of course a far more complicated question, depending in part on how exchange mechanisms (normally the operation of the market) work and on the overall level of resources available in the context of the city or region in question. At the same time, as emphasized above, this must be contextualised with respect to the wider stability or instability of economic processes and markets and the velocity of capital turn-over. Increasingly unstable markets and reducing

time horizons increases vulnerability and reduces the possibility for disaster prevention even in regions where resources are plentiful.

The existence of monetary or non-monetary reserves in themselves do not necessarily imply a greater capacity for absorbing the impact of a hazard. A vulnerable house will still fall down whether or not its owner has money in the bank. However, obviously the existence of reserves is an important factor in recovery. Vulnerability is clearly greater when reserves are non existent.

Another variable, which must be included is whether people have access to technology which enables them to use available resources for disaster prevention. Whether or not people have access to technology is not only a variable of vulnerability, but also a crucial question for the implementation of disaster prevention and management programs. Lack of access to technology is generally at least as important as lack of resources themselves.

Social Variables

Social organization is another important variable in vulnerability. Evidence provided in many case studies (Caputo, Hardoy and Herzer 1985; Maskrey 1989; Maskrey and Lavell 1993) proves that in general, organized communities are more capable of responding to disasters and initiating recovery processes than disorganized communities.

Often, however, community organization does not exist *per se*, but arises through the need to deal with common problems which cannot be dealt with on an individual basis. Whether the organization is territorial or functional, a grass roots organization or an extra-local organization (like a church, for example) or whether it is permanent or circumstantial, are all characteristics that vary enormously from one spatial and temporal context to another and which influence the relationship between organization, vulnerability and disaster prevention.

Another important variable is people's previous organizational experience. If a grass roots community organization already exists to solve other problems, then its presence can be a catalyst for initiating disaster prevention activities. However, more research is required regarding the conditions in which past organizational experiences can transcend themselves and be applied to disaster prevention.

The relationship between the scale of social organization and the scale of a disaster or vulnerable area is also very important. In many cases (Maskrey and Lavell 1993), second tier organizations (fronts, coalitions, etc.) may play an important role in coalescing smaller organizations, but at the same time encounter enormous difficulties in terms of achieving any level of stability and operativity. Despite the key role often played by these organizations, they often have legitimacy problems, both with respect to their own constituency organizations as well as with respect to the official agencies, with whom they try to interrelate and negotiate.

How an organization is articulated within a community is another highly important variable. The effectiveness of an organization

depends on factors such as its structure, its degree of representation and participation, and on how it manages to integrate different ethnic, social or gender groups. Many community based disaster prevention projects fail simply due to unresolved organic problems within organizations themselves

Finally, any community organization is conditioned by broader contextual variables in the political economy. Social organization is usually sensitive to changes in political and economic circumstances and most organizations go through periods of growth and consistency followed by periods of disintegration and crisis. The stage at which an organization is going through when a disaster occurs will crucially affect its capacity to respond and therefore has a direct repercussion on vulnerability.

Cultural Variables

Another group of variables which intervene in people's vulnerability, concerns their cognitive perception of hazards and associated risks.

First of all, it is obvious that the importance people assign to disaster risk is related, one way or another, to the type, frequency and magnitude of potential hazards. A community is more likely to feel threatened by annual floods than by a volcanic eruption which may not occur for five centuries. Nevertheless, at the same time, a single historical catastrophe may acquire more symbolic importance for a community than any number of minor disasters which can be incorporated into their daily lives as unfortunate but irremediable events and therefore may condition their vulnerability.

Vulnerability, however, also depends on the age and origin of a community. There are considerable differences between a community which has inhabited a region for several centuries and a community of recent migrants. In particular, recently formed communities in marginal urban areas are often unaware of the history of hazard occurrence in those areas or of traditional local mitigation measures.

Rapid social, territorial and economic changes play a fundamental role in disadaptation to hazard. Apart from the problem arising when a population migrates from one region to another and has to adjust to new and unknown hazards, even centuries old communities become disadapted as a result of the rapid and unstable economic, ecological and social changes occurring in their surroundings.

Another variable that has a decisive influence on vulnerability, is the relative emphasis placed on different kinds of risks in different activities: farming, employment, housing, environment, etc. In general, the importance assigned to hazard-related risks depends on the variety and the weight of all the other risks faced by people. At the same time, it is important to know the psychological structures through which people interpret risk. The existence and co-existence of magical, mythical and rational structures is expressed both in people's conception of disaster as well as the way they deal with them.

Another important variable, is people's view of themselves in the future. People usually place more emphasis on the future than on

the present or the past and how they imagine their future is usually a determinate decision-making factor. Needs are rarely "objective" according to exogenous criteria; they depend on past and present culture and on future hopes and dreams. Needs therefore acquire a subjective-objective, dream-reality status. A population is not only defined by what it is or what the field worker considers it to be, but by what it wants to be in the future.

Needless to say, peoples conceptions of disaster are by no means autarchic. They are increasingly influenced by the outside world and by the ever more global reach of mass media. Technological images from other cultural contexts play an increasingly prominent role in how people interpret disaster and exert a tremendous influence on the acceptance or rejection of exogenous technologies which may be introduced in a disaster prevention program.

Institutional Variables

Institutional variables are also important in explaining vulnerability. For example, whether grass roots organizations have formal or legal status will probably determine whether they can participate or not in official decision-making processes or in the management of resources, or whether local decision-making processes can become integrated with and exercise some influence on centralized decision-making.

Other variables which must be considered are the degree of centralization of the official institutions responsible for disaster prevention and management. Some may be so so centralized that they cannot interrelate directly with grass roots organizations at all. Another important question is whether local governments or NGOs, have enough weight and legitimacy to be able to mediate in the negotiations between grass roots organizations and central government.

Towards an Intervention Strategy

The first step towards defining appropriate disaster prevention models, is to compile a typology of vulnerability and potentials for disaster prevention, so as to able to articulate a set of appropriate responses. In this paper the sets of variables described above at least point to the kinds of typology which could be developed. It is obviously impossible to cover all the different technological and methodological alternatives for disaster prevention, which could be applied to each different vulnerability scenario. Nevertheless, it is possible to suggest a number of basic methodological principles which should characterize any exogenous intervention strategy.

Firstly, as stated above, disaster prevention cannot be based on a purely instrumental consideration of how a structure or a community is at risk with respect to a specific hazard; it must be based on an analysis of vulnerabilities in the context of peoples own conception of disaster. This requires immersion in people's lifestyles and customs and the ability to interpret and synthesize achronical and acausal variables - a task that is apparently closer to art than to science.

The central idea presented here is that an effective program must take as starting point the real potential for disaster prevention which exists. There is no evidence that people are inherently conservative or resistant to change or outside interventions *per se*. On the contrary, when strategies are implemented which are articulated to their complex of needs and which

can be introduced into their technological world. people can be extremely receptive and innovative.

In conceptual terms, this means that disaster prevention should not be conceived as a vertical top-down process to transfer specific "technological packages", which once inserted into a particular context may be rejected by local people or may produce absurd and delirious results. On the contrary, the process must base itself on the development of appropriate technological alternatives that combine exogenous scientific and technical contributions with peoples own resources and rationalities. Disaster prevention "plans" drawn up and implemented in a social vacuum must be replaced by a planning process articulated to those who really take decisions regarding development in the area in question.

Disaster prevention must therefore be built up on the principle of maximising the range and variety of technological and methodological information available to vulnerable people so as to increase the possibility that specific prevention measures, in a specific area, meet specific needs at a specific time. Exogenous disaster prevention measures should be regarded as loose pieces of different jigsaw puzzles in search of a new jigsaw puzzle in which they can fit. By multiplying the possibilities for encounters between different jigsaw puzzles and the available loose pieces, the chances of successful prevention also increase.

An example taken from the reconstruction after the earthquake in the Alto Mayo in north-east Peru, may help to visualize this point (Maskrey 1992b). An agency involved in reconstruction wanted to introduce a housing system using prefabricated "*quincha*" panels using sawn timber and cane. Another agency preferred to improve traditional *"quincha"* houses, using pole timber and on-site assembly. The main advantage of the first system was the fact that prefabrication saved time. However, the cost of using sawn rather than pole timber was far higher and people never accepted the prefabricated system. In the Alto Mayo, time was people's principal resource. There was no incentive to save time, while cost was a strong deterrent. Anyway what would people have done with all the time they could have saved?

On the other hand, although the improved *quincha* housing was widely accepted by people for its earthquake resistance, it was criticized by users due to its limited resistance against bullets and rocket propelled grenades: a real problem in a region with severe problems of public order. It was the technology which could mesh in with peoples own conception of disaster, that was successfully incorporated. The other apparently technologically superior building system was rejected because it did not fit.

Secondly, and following on from the first conclusion, vulnerable people must change status from "object" to "subject" in disaster prevention programs. This certainly does not mean that "everything that people do is right". Often enough, people implement their own disaster prevention measures simply in self-defense against increasing external pressures and threats. Vulnerable people faced with a wide variety of risks, have to adopted and adjust to all sorts of structural pressures in order to survive. This kind of disaster prevention is neither planned through formal channels nor adapted by people in an organized or conscious way. Rather it is introduced gradually into daily life through the interaction of multiple individual decisions.

It is possible, however, that this panorama changes if people's organization allows collective reflection and decision making on the problems faced. Such collective processes increase people's awareness of their vulnerability and of the technological alternatives available to solve their problems.

Experience in Peru has proved that social organization increases awareness of the possibilities of disaster prevention, transforming it from essentially defensive incremental changes to a form of counter-attack on vulnerability. This implies people taking on a more protagonic role, reassessing their own technological resources and carefully selecting complementary exogenous inputs.

These conclusions inevitably lead us to a central problem: communication. What real possibilities are there for positive, fruitful, two-way communication between researchers and planners and vulnerable people? There are no recipes or easy answers to this question, but at least three issues which need to be considered.

Firstly, it must be stressed that it is the responsibility of researchers and planners to achieve a real understanding of peoples vulnerabilities and potentials, and to seek to design appropriate interventions. Without this understanding, disaster prevention projects and programs conceived in a social vacuum are almost always doomed to failure. Nevertheless, experience shows that close mutual relationships between researchers and planners and vulnerable people are far from easy to establish. Undoubtedly the former have more formal experience and know-how than the latter and which both parties consider to be superior to people's own experience and resources. Normally relationships of this kind are neither symmetrical, complementary nor reciprocal; quite the contrary, it is a kind of relationship in which power plays a fundamental role. This power can be handled in many different ways, but it can neither be denied nor ignored.

Secondly, instead of introducing rigid "technological packages" which are difficult to disaggregate and which as has been stressed often result in failure, it is preferable to introduce loose technological elements that can be combined with people's existing technology and which can participate in an iterative process of adjustment, alteration, adaptation and innovation. If applied in this way, disaster prevention technology can become a catalyst for far wider social, economic and cultural developments and changes. In this sort of strategy, technology and its dissemination is no longer an end in itself but rather becomes a component of a wider process of change.

Thirdly, in order to maximize the likelihood of successful embedding of exogenous technological elements in people's own technological world, it is vital to strengthen horizontal networks and contacts which can allow people to have access to information and share and transmit it to others. It is enormously important to create channels for systematizing the results of local disaster prevention experiences and for synthesizing the methodological and technological elements that may be applicable in other contexts. The more successful methodological and technological elements which can be synthesized from the rich experience of local disaster prevention in Latin America and the Caribbean, and the more other vulnerable people can be exposed to these elements, the greater the chances of success for disaster prevention in the region in the future.

At the same time, however, all these issues must be relativised and contextualized, taking into account the rapidly changing vulnerability patterns described earlier in this document and which makes any local reduction in vulnerability essentially provisional. The success of any strategy will depend on whether it is appropriate or not for real local vulnerable conditions. Nevertheless, as previously emphasized, these conditions are increasingly unstable and ephemeral. This means that disaster prevention measures that are appropriate at a given time and place will have to be permanently questioned, deconstructed and reassembled as vulnerable conditions themselves change. This in turn means that both

successes and failures are only provisional. Disaster prevention and management must be understood as a process rather than as a categorical program with a clear cut beginning and end.

Conclusion: Facilitating a Transition in the IDNDR

The question is open. Having established a general methodological outline for more appropriate disaster prevention models in Latin America, consideration must be given as to how to transform the existing situation. In this final section of the document, recommendations are presented which could serve as an initial proposal for transforming the existing institutional framework in which disaster prevention is currently carried out in the region.

Firstly, it must be stressed once again that given the rapid accumulation of vulnerabilities in peripheral regions of Latin America, "unexpected" disasters are likely to occur more and more frequently. At present, while considerable research and implementation focuses on monitoring the evolution of hazards, vulnerability as such continues to be a relatively marginal research field. If disaster prevention in the region is to have any sort of solid rationale, information systems must be created which allow the monitoring of change in vulnerability patterns. Only when hazard monitoring is complemented by vulnerability monitoring will it be possible to monitor and measure the spatial and temporal evolution of risk as such. Having an accurate assessment of risks is obviously the starting point for any viable disaster prevention strategy.

Secondly, it is necessary to recognize that the most important resources for disaster prevention are endogenous to the region. A revaluation of endogenous resources and potential is necessary in order that the limited exogenous resources available can be applied in a more complementary and efficient way. Disaster prevention models, must be made more decentralized, popular and realistic. In other words, these models need to be reformulated on the basis of the multiple conceptions of disaster, which exist in the region, breaking out of the straight jacket of the formal conceptions on which they have so far been based. To do this probably requires a number of changes in the institutional framework.

So that the official agencies responsible for disaster prevention and management may establish a closer relationship with vulnerable people and become more sensitive to their own conceptions of disaster, it is important to achieve a greater real decentralization of these agencies to the local level. Permanent coordination mechanisms for disaster prevention are required in the regional economies and their urban centers. Such mechanisms could provide an institutional framework capable of handling emergencies and reconstruction processes in addition to pre-disaster prevention and management activities, avoiding the chaos which still characterizes most interventions at present.

At the same time, it is necessary that these institutional frameworks be modified to allow grass roots organizations, NGOs and other local actors a level of formally recognition and real participation, without the need to create *ad hoc* and parallel coordination mechanisms, when disaster occurs. It has been proved that organizations which already exist in a region in "normal" times are a major resource for efficient and effective disaster prevention. Formal institutional frameworks must therefore seek to incorporate these organizations instead of marginalizing them.

Similarly, in the same way that disaster prevention models must be based on people's multiple conceptions of disaster, it is vitally important that

these conceptions are projected positively by mass media, acknowledging the enormous impact of the media on decision- making at all levels. As both the actions of decision makers and media images are at present derived from the formal conceptions, working with the media is a key window of opportunity to make interpretations of disaster prevention more effective.

The models generated would almost certainly place less emphasis on emergencies as such and focus much more on the possibility of developing appropriate rehabilitation and reconstruction strategies, using local and regional institutional, material and technological resources, as well as creating opportunities for pre-disaster prevention and management. They would almost certainly place less emphasis on the role played by international aid. On the contrary they would emphasize a variety of technological and methodological instruments appropriate to different local and regional vulnerability patterns.

Finally, the lack of serious research from a social perspective on disaster prevention in Latin America, has been stressed throughout this document. Such research could allow the generation of an empirical data base to support the kind of arguments presented in this document and influence the principal institutional actors in the region. Comparative research work, the creation of communication channels which allow the dissemination of the results of research studies, in addition to achieving levels of institutional coordination, which can maximize the possibilities of research influencing policy, is a task that has only just begun systematically by the Network for Social Studies on Disaster Prevention in Latin America -LA RED. This research is vital in order to change the curriculum for training disaster prevention experts in Latin America. The arguments made in this paper could serve as starting point for a new kind of disaster prevention training in Latin America, based not on the formal conception of disaster but on the real ways that disasters occur and are prevented in the region.

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