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**DISASTER PREVENTION AND MITIGATION
IN LATIN AMERICA:
REFLECTIONS ON RESEARCH PRIORITIES
AND INSTITUTIONAL FRAMEWORKS**

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I. ANTECEDENTS AND CONTEXTUALIZATION:

The nature of the information and discussion requested by IDRC in response to the URB GPI statement on disaster research inevitably requires, we believe, an effort to place the problematic in some sort of historical context. This relates particularly to the development of a social science approach to disaster research in Latin America and associated human resource and institutional frameworks. In view of this, prior to considering the specific aspects raised in the request for the present document we will venture to highlight some of the more pertinent aspects which have a bearing on this task.

Research on disaster related issues in Latin America has been dominated to date by natural, basic and engineering science approaches. That is to say, research on the physical triggering mechanisms of disasters, their temporal recurrence, and spatial parameters (earthquakes, volcanic activity, hurricanes, flooding and landslides etc.) and on hazard resistant building structures (See Rogge, 1992; Lavell, 1993).

The full recognition that disasters are the product of social processes and that the responses to these are conditioned by the social, economic, and political structure of society has only slowly taken hold amongst the research community in Latin America. Permanent social science research on disasters (as processes and products) has been relegated to an incipient secondary level in comparison with conjunctural endeavors related to the postimpact study of affected populations, institutional responses and reconstruction efforts (see for example, Comfort, (1989); Anderson and Woodrow (1989), Abril Ojeda (1982); Bates (1982); Bommer (1985); Bommer and Leadbetter (1987); Peacock (1987)). These studies have been undertaken in many cases by researchers from North America and Europe. Indigenous research has in general been undertaken by social scientists who 'flow' into the disaster area momentarily, only to return to their dominant research areas once the disaster has been 'forgotten' or the immediate crisis, emergency and rehabilitation stages overcome.

The overall result of the neglect given to the social aspects of 'disasters' is a serious dearth of institutions, and individual researchers exploring these themes in the subcontinent. Incipient attempts during the 1980's to stimulate

social disaster research turned out to be short lived and fleeting. Such is the case, for example, with the work group formed by the Latin American Social Sciences Council (CLACSO) which sponsored two Latin American disaster discussion forums in 1984 and 1989 and, henceforth, disappeared from sight. This group produced two of the very few existing collective publications on disasters and society in Latin America (see Caputo, Hardoy and Herzer, 1985; IIED, 1990).

The novelty of a social approach to disaster studies among Latin American social scientists; the dominance of the physical science paradigms in determining research themes and financing options; a tendency to see the social studies of disasters as something rather oblique and not of permanent relevance; the lack of a peer group stimulus for social scientists to become involved in disaster studies and the existence of other more prevailing social science research 'fads'; and the lack of an institutional base and stimulus for promoting the social study of disasters, amongst other reasons, can help explain the state of affairs prevailing at the end of the 1980's (see Lavell, 1993).

The 'dominant' research and activity emphases found in the limited 'Latin American' social science contributions during the 1970's and 1980's undoubtedly related to the aforementioned post disaster impact and reconstruction studies, in the wake of major disasters such as the Guatemala, Managua, Mexico City, San Salvador, Chilean and Peruvian, Yungay earthquakes; the volcanic eruption of Nevado de Ruiz in Colombia; the Fifi and Juana hurricane episodes in Central America and Hugo and Gilbert in Mexico.

Studies in the area of disaster prevention and mitigation, and on human vulnerability to disasters were basically limited to the individual research contributions presented in the 1985 and 1989 CLACSO and IIED publications; and to the pioneering research and systematizing work of the Centre for Disaster Prevention and Mitigation (PREDES) and the Intermediate Technology Development Group (ITDG), in Peru, and the National Training Service (SENA) and the Foundation for Popular Communication (FUNCOP-CAUCA), in Colombia. These latter organizations were instrumental in introducing the concept of 'vulnerability' in disaster analysis in the region; and, in the promotion of a locally oriented, popular, grass roots, nonstructural approaches to prevention and mitigation, as opposed to the dominant, state promoted structural engineering approaches prevalent in the few articulated attempts at disaster planning in the subcontinent.

The work undertaken in South America (Peru and Colombia, in particular) in the prevention and mitigation field was added to in the late 80's and early 90's by a comprehensive study undertaken by the Central American University Confederation (CSUCA) in the six Central American countries on human vulnerability and the conditioning factors and options for disaster prevention and mitigation. This study, undertaken with IDRC support, allowed the development of an incipient social science research network in the isthmus and the production of the most wideranging background study available to date in Latin America (see Lavell, 1991).

The incipient research on the social aspects of disasters was accompanied by the predominance of training and capacitation schemes promoted by such international organization as the Pan American Health Organization, The Office for Foreign Disaster Assistance (OFDA) of the U.S. Agency for International Development, the U.N. financed Disaster Management Training Program (DMTP) at the University of Wisconsin and by the Organization of America States (this latter organization has also promoted a number of interesting analyses related to mitigation, particularly in terms of the vulnerability of the strategic energy sector to disasters). The major emphasis of these schemes has been on the training of 'disaster managers' from international, governmental and non governmental agencies or organizations. The capacitation or training of grassroots organizations and representatives was essentially limited to the efforts of a few locally based non governmental organizations, although the well developed Colombian National Office for Disaster Prevention and Attention has made a very important contribution to the preparation of local level organizations, and in the stimulation and financing of pertinent research endeavors.

The IDRC URB GP1 statement comes at a time when the increasing magnitude of the disaster issue in the developing world and the beginning of the U.N. Decade for Natural Disaster Reduction have served to call increasing attention to the social or human vulnerability aspects of disaster prevention and mitigation.

The pioneering study by Cuny (1983) on the relationships between 'Disasters and Development' and the now widely accepted dictum that disasters constitute "unresolved development problems" (see Wijkman and Timberlake, 1984) have had an increasing influence as regards the ways we see disasters and the solutions to them. On the other hand, Wilches Chaux (1989), Anderson and Woodrow (1989), and Cannon (1992) have helped in promoting vulnerability and capacities analysis in any

consideration of disaster impact and in the formulation of nonstructural approaches to disaster mitigation attention, rehabilitation and reconstruction. These approaches to disaster planning promoted amongst others, by the U.N. System (Development Program, Disaster Relief Office, Habitat, UNICEF, etc.), have recently been given increasing attention by multilateral international development or humanitarian agencies such as the World Bank (see Kreimer and Musnaginghe, 1992), the Organization for Economic Cooperation and Development (OECD), the International League of Red Cross Societies and OXFAM.

The UNDP/UNDRO commitment to research on the social aspects of disasters and to an increasing attention to nonstructural approaches to disaster planning is reflected in the recent publication of an important "Research Agenda for Disaster and Emergency Management" (Rogge, 1992); and, a concomitant pool of funding for disaster management studies administered by INTERTECT Training Services on behalf of the UNDP/DHA Disaster Management Training Program (DMTP) at the University of Wisconsin.

In sum, at the beginning of 1993 the disaster problematic and its relationship to development is part of the established agenda of a number of important international agencies. Numerous and diverse research priorities have been established which have pushed the problematic (at least on paper) into the social and environmental spheres and, increasingly, away from the previously dominant geophysical and structural engineering fields.

Despite these developments at the international level various operational 'incognitos' remain to be addressed. These are, in many ways, at the heart of the IDRC URB GP1 statement, and the debates it may suscite.

Firstly, what are and should be the roles of 'topdown' (governmental) and 'botton-up' (people and communities) approaches to disaster prevention and mitigation in developing area contexts. This aspect clearly relates to the 'dependent' relationship that could develop between potential intergovernmental or international financing sources, their priorities and approaches (structural solutions, advanced technology transfers, strategic sector prevention and mitigation, etc) and national government approaches. This is particularly important in contexts where governments may be unwilling or unable to dedicate perceived scarce 'national' resources to 'autonomously' generated socially equitable disaster prevention and mitigation activities where these do not seem to offer a positive cost-benefit equation in the short

term. How can policy oriented research change such a potential situation, guiding governments to more autonomous decision making processes, away from high technology fixes and in favour of community based intermediate level structural, and non structural approaches?

Secondly, if a continued disillusionment or disbelief prevails in terms of the role of governments (national, in particular) in promoting disaster prevention and mitigation, what are the most adequate approaches and research priorities relating to the promoting of community and local level schemes where the universe of study and action is so vast, and no homogeneous, unique model of action could possibly exist? That is to say, how do we, with scarce human, financial and institutional resources face up to the vast challenge of stimulating relevant, appropriate and economically viable approaches to disaster prevention and mitigation at a community level where the infinite number of urban (and rural) communities differ significantly in terms of such critical intervening variables as their levels of risk perception and acceptance, priority development problems, resource (human, intellectual, material and financial) availability, and organizational levels.

In raising these questions, there is an inevitable need to broach the problem of the ways that national and local governments could be 'persuaded' to facilitate community based approaches, serving as supports to these, instead of persisting with a disarticulated approach where indigenous research institutions and some international agencies work independently at a local level, with little government support (not to say approval). Is the Colombian system with strong activity links between government, NGOs and community based initiatives not a better (and attainable) option than unilateral support for an 'us' against 'them' approach?.

Thirdly, whatever be the most appropriate approach to research and action related to disaster prevention and mitigation in developing countries in general, and in Latin America, in particular, the inevitable question arises as to with whom and with what institutional frameworks do we operate?. And, how do we potentiate the impact of and 'cultivate' the very limited research resources available in this area of study and action. Here it is impossible to avoid the discussion of the role of individuals, institutions and networks and the way we may introduce disasters into the agenda of development oriented institutions be they NGOs, universities, or government agencies, whether disasters be, or have previously been of direct concern to them.

II. REGIONAL RESEARCH RECORD ON DISASTER PREVENTION AND MITIGATION: STRENGTHS AND WEAKNESSES IN RELATIONSHIP TO THE URB GP1 STATEMENT.

The content of our introduction section indicates the very limited amount of social science research undertaken to date on the disaster problematic in Latin America in general.

As regards the emphases, aspects and specific objectives incorporated in the URB GP1 statement, likewise the number of experiences known to us is commensurately low, particularly as regards prevention and mitigation of urban disasters.

The research emphasis (both substantively and methodologically) proposed in the URB GP1 does in fact comprehend various high priority research emphases not made explicit as such in the document but which are important to comment. These relate to research objectives that are essential to the successful implementation of community oriented action research which searches to clarify accountability and responsibility; to promote attractive solutions; to stimulate awareness and autoevaluation of risk; and to facilitate documentation, dissemination and methodological advances. These relate to cross cultural, cross community, and family level research on:

- i) risk perception and risk acceptance. This necessarily includes a consideration of the importance conceded to environmental risk by different population groups and how this relates to or is ranked in terms of other persuasive, and, at times, seemingly unrelated or discrete social problems faced by communities (housing, unemployment, health, security, drugaddiction, etc.). Intercommunity and interfamily differences, and the specification of these aspects, are critical factors in any attempt to promote community based, culturally adequate mitigation and preparatory activities.
- ii) cultural, financial, material and organizational resources available for grassroots promotion of prevention, mitigation, preparation and recovery activities.
- iii) social vulnerability and capacities analysis (connected to ii), above).

- iv) autonomously or externally stimulated adaptation and adjustment strategies to environmental risk. Rural strategies have been the object of a fair amount of research, particularly in areas subject to drought. (see Clarke Guarnizo, 1992). However, urban population strategies have received very little attention. Critical importance must be attached to the generation and systematization of knowledge on existing strategies and the objective conditions for their development (length of residence, experience with, and repetitiveness of risk factors; financial, material and intellectual resources; organizational experiences, etc.).
- v) research which promotes the application of socially relevant basic and physical sciences knowledge (geology, geomorphology, climatology, ecology, etc.) to disaster prevention and mitigation at a local, regional or national level.

A significant part of the research related to community based mitigation activities undertaken to date has been limited to a reduced number of countries -Peru, Colombia, Ecuador and Central America, in particular. Less systematic studies can be found in other latitudes (Chile, Argentina, Brazil, for example). The critical factor explaining the relative spatial (country) concentration of research and activity endeavors is, undoubtedly, the existence of relatively well consolidated institutional frameworks (if limited in numbers) which have promoted certain continuity in the mitigation field, and have allowed more dispersed individual efforts to establish a point of contact. This has a 'collective' reflection on research initiatives and experiences within a single country or geographical region i.e. the incipient or consolidated existence of networks.

Undoubtedly, the most significant project or programme activities and action-research endeavors and results have been achieved directly by or under the stimulus of PREDES, initially, and later, ITDG in Peru; the Servicio Nacional de Aprendizaje (SENA), the Fundación de Comunicación Popular (FUNCOP-CAUCA), and the Observatorio del Sur Occidente (OSSO) of the University of Valle (Cali), in Colombia. The work of these institutions has generally included both schemes for disaster prevention and mitigation and activities in the area of postdisaster reconstruction and rehabilitation. This relationship or activity profile, cutting across different phases of the disaster planning cycle, is significant in itself in that it is clearly demonstrable that efforts at stimulating community

involvement in prevention and mitigation are facilitated where previous experiences with disaster or emergency contexts provide objective conditions (consciousness, awareness, incipient or consolidated organizational base etc) for the promotion of such efforts.

In itself, this relational context immediately poses a significant action research challenge as yet subject to very little, if any attention. That is to say, the development of research methodologies and activities with urban communities that are subject to growing conditions of environmental risk (due to the urban dynamic as such) but which have no, or very little direct experience to date with physical hazards or disaster conditions.

The work of the abovementioned groups and the systematization of experiences and results, (including those of associated researchers and practitioners) is summarized in a limited number of publications, particularly in Maskrey (1984 and 1989); Maskrey and Romero (1986); Medina and Romero (1992); Wilches Chaux (1989); and Caputo, Hardoy and Herzer (1985). At a pure research level, with no explicit action research component at the urban community level, significant aspects related to physical risk, human vulnerability and the limitations to prevention and mitigation activities derive from the previously mentioned CSUCA study undertaken in the six countries of the Central American isthmus (Lavell, 1991).

The studies and work synthesized in these documents all have a direct bearing and relationship to the URB GP1 emphases and objectives. A succinct summary of the science, technology and policy making contribution of the as yet limited number of endeavours undertaken should emphasise the following aspects:

- a. adequate levels of consciousness and awareness of environmental risk (including causal factors and levels of risk perception) are a necessary but not sufficient condition for the appropriate promotion of prevention and mitigation activities through community or government participation. Awareness must necessarily be crossed with knowledge of risk acceptance and the range of possibly more pressing (and permanent) social problems to which a community or government feels it needs to respond with limited existing material, financial or organizational resources. The success of schemes for community based mitigation thus rests in good part on an adequate knowledge and reading of the ways communities view risk and their levels of acceptance of this.

- b. The opportunities for successful participatory, community based mitigation activities will be increased to the extent that disaster risk and mitigation are not conceived as an isolated, discrete problem but, rather, as a component of the overall social and economic problematic of the community (including health, housing, education, employment, etc).
- c. limitations in terms of knowledge of the possible range of mitigation activities available (particularly non structural) constitutes an important limitation to community based participation and the stimulation of culturally adequate schemes. The dominance of relatively high cost structural solutions or relocation schemes in the mentality of different population groups can serve to 'displace' the options for mitigation away from the community, placing the onus on local, regional or national governments. Consequently, a pressing need exists for the systematization and accessing of successful local level experiences. This must include both schemes facilitated by "external" actors (NGOS etc.) as well as those autoctonously or autonomously generated at the community level (adjustment or adaptation strategies).
- d. The major starting point for community based mitigation is the community itself, it's cultural, material, and organizational resources. The role of 'external' actors must be limited to that of 'facilitators' of a process whether it be in terms of knowledge of risk factors or vulnerability, or in the proposition of mitigation solutions. The design and accessing of methodological instruments allowing autoevaluation of risk and vulnerability and the proposition or programming of mitigation options are important facets of the facilitating process. Important advances have been made in terms of the development and application of rapid and simple risk and vulnerability evaluation methods at the community level (see the work of ITDG and OSSO, for example). Such methods can very usefully be diffused and accessed to other professional groups working on local level mitigation.
- e. Successful mitigation schemes should be based primarily, and in the first instance, on local resources (including organizational attributes). Secondary, external resources should be integrated within the framework of schemes based on local resources. The existence of autonomous, community controlled schemes is the most adequate basis in the search for and pressure to gain governmental (local or national) financial or technical aid.

- f. The existence of "community" is subject to the existence of an organizational basis for community promotion. Mitigation activities are difficult to promote where such a preexisting organizational base is nonexistent. 'External' actors are unequipped, in general, to foster such organic forms. Mitigation activities do not require the existence of specific disaster prevention organizations as such. Rather, these activities can and should be promoted on the basis of existing, developmental and community oriented organizations.
- g. Commensurate with the former aspect, "external" or facilitating support and participation need not have to come necessarily from 'disaster' NGOs, associations, research centres, etc. Rather, disaster mitigation, seen as the resolution of development problems, should be actively incorporated in the work of diverse organizations working on sectorial problems with communities (housing, watersupply, energy, health, environmental management, agriculture, solid waste removal, women and children, education, etc.).
- h. The evidence from studies of postdisaster emergency relief and reconstruction processes in Latin America, and elsewhere, clearly indicate the pertinence of the majority of the points made in a-g, above, to these phases (see Anderson and Woodrow, 1989; Maskrey, 1989; Medina and Romero, 1992). In itself, this conclusion clearly indicates the need for a disaster research and action framework which cuts horizontally across the 'discrete' phases of disaster planning. Here it is clear, for example, that community based, organized disaster mitigation schemes have a definite positive impact in terms of possible emergency preparedness, response and reconstruction. Likewise, a successfully implemented community based reconstruction process will enormously facilitate the incorporation of local level, forward looking mitigation activities.

Despite the advances made in the areas mentioned in the URB GP1 statement, there is a clear need for further research on all of the aspects mentioned, due to the as yet limited spatial scope of the work undertaken to date, and the diversity of potentially differing contexts existing at an urban and cross national level. In particular we would point out that:

- a. to date a good deal of the action research activity undertaken on mitigation has been in smaller urban centres. These, along with intermediate size centres, are probably more 'accessible' to this type of work. Whilst additional attention should be given to this type of urban centre, given that their population and environmental risk growth rates will probably be very high in the future, more work should also be promoted on the more complex metropolitan city environments where the present day range and intensity of disaster impacts is higher.
- b. Increased emphasis should be given to the problematic of technological or anthropic disasters (explosions, urban conflagrations, spills of toxic fluids etc.). The widespread lack of land use zoning; inadequate controls on the use, storage and distribution of inflammable, explosive and toxic materials; problems with urban water supplies etc are increasing the risks of urban technological disasters.

During the last month in Costa Rica alone, four 'large' scale urban disasters have occurred, including a massive discharge of bunker into a San Jose river, the complete burning out of ten blocks of the centre of one provincial capital, Santa Cruz, and the explosion of a central San Jose chemical factory. Larger and more complex urban centres are exposed to even more devastating episodes (e.g. the Guadalajara gas and Mexico City petrochemical explosions and conflagrations).

Urban Agriculture, Water, Wasted and Disasters:

Disasters at the urban level, are increasingly related to environmental mismanagement. This is particularly, but not exclusively the case with reference to flooding and landslides; and, contamination of land, air and water, with the attendant problems this can bring in terms of human health, epidemics, etc.

Various possible (or real) relationships are, from our perspective, worthy of consideration, namely:

- a. the depletion or removal of the natural (forests in particular) or anthropic (agricultural) vegetation cover of urban hills, slopes or river banks and its negative impact on pluvial runoff levels, sedimentation rates, fluvial discharge and slope stability. This is particularly accentuated when 'natural' land uses are substituted by

urban construction schemes. These processes can also have a profound impact on aquifer levels and recharge, with commensurate effects on water availability for human consumption. The increasing need to transport alternative sources of water to cities from surrounding 'rural' areas can lead to a depletion of water availability for agricultural or recreational practices.

A clear potential exists for the promotion of urban agriculture (not only crops but also recreational forests and 'gardens') in ecologically and physically unstable areas not only as a means of restoring environmental equilibrium, but also as a competing social and economic use for risk areas in opposition to their use for marginal human occupation. The success of these measures, where not established by legal and normative considerations, will depend on expected economic returns and the availability of alternative, secure sites for human habitation.

- b. Urban (and rural) water resources are being continuously depleted by uncontrolled 'dumping' of human, domestic and toxic industrial waste. The impacts in terms of the access to safe and economically accessible water supplies and in terms of the threat of epidemics and other health related problems are clear. Moreover, direct solid and liquid waste deposits in urban river channels are a known causal factor in the increased risk of urban flash flooding.
- c. Solid waste deposits from domestic uses are posing increasing problems to human health, and in terms of the contamination of water resources. This is particularly problematic where such deposits are subject to human occupation and are the source of family "incomes".

III. RESEARCH CAPACITY:

In the Latin American region very few institutions exist that are dedicated specifically to the social study of disasters or which have a clearly delineated permanent area of work on this topic. The limited research community is essentially comprised of 'individual' researchers located in a variety of universities, NGOs, popular organizations or government agencies.

To take but one country example, Mexico, only one institution, CIESAS, (Centro de Investigación y Estudios

Superiores en Antropología Social)* has an area dedicated to disaster studies, whilst the remaining disaster research workers registered with the Consejo Mexicano de Ciencias Sociales (COMECOSO) are distributed in different centres. In Central America, there are only two small specialized research and training centres -the Centre for Disaster Protection (CEPRODE) in San Salvador and the Church Council for Emergencies and Reconstruction (CIPER) in San Jose, Costa Rica. This situation prevails throughout Latin America, with a greater relative concentration of institutions or researchers in Colombia and Peru (PREDES continues to be the only specialized centre in this latter country).

Apart from the centres mentioned above, the number of institutions with a definite area of disaster specialization is also, to our knowledge, commensurately very low: Intermediate Technology (ITDG) in Peru; the Foundation for Popular Communication (FUNCOP-CAUCA) in Popayan and the Observatorio Sismológico del Sur Occidente (OSSO) in Cali, Colombia; the Secretariate General of the Latin American Social Sciences Faculty (FLACSO) in San Jose, Costa Rica; Companions for the Americas in Ecuador; the Faculties of Architecture at the University of San Carlos, Guatemala and at the University of Merida, Venezuela; and the Centre for Disaster Studies at the University of Paraiba, in Brasil.

According to our knowledge of recent research and activity priorities all or any one of the above mentioned institutions have a clear orientation towards community level approaches to disaster prevention and mitigation and would, consequently, be potentially relevant partners in the implementation of the URB GP1 objectives. The expertise, record and facilities of these institutions are unquestionable. As regards their institutional partners in the country or region these have been diverse and varied, according to the particular activity undertaken and have included other development oriented NGOs (lay and ecclesiastical or ecumenical), popular grass roots organizations, local and national governmental organizations.

The matter of "institutional partners" or relationships necessarily leads on to a consideration of the principle of networking as a basis for research promotion. This is particularly important in the Latin American context where the number of specialized institutions, the number of specialized

*/ The coordinates and lead researchers of each institution mentioned in this section are included in Apendix 1.

'disaster' researchers they employ, (probably averaging between 3 or 4), and the number of 'independent' researchers are all very low.

This context makes the principle of networking and interinstitutional collaboration unavoidable. Only through such forms of collaboration can one hope to potentiate the impact of the limited resources available to date, permitting the distribution and accessing of relevant methodological advances and the promotion of cross cultural, transnational comparative studies and activities in the prevention and mitigation fields. Moreover, despite the existence of a relatively limited number of specialized centres or research areas these play an important magnetizing, peer group, or reference role for the individual, dispersed institutional researchers in the different countries. Here, it is also important to consider the potential for incorporating local NGOs and university research units with no previous specialization in this area into the disaster research problematic. Given that the vulnerability to disasters and the solutions to these are clearly related to 'development' principles, disaster prevention and mitigation should necessarily be a widely diffused concern amongst sectorially specialized development oriented institutions (housing, health, agriculture, water provision, etc.).

The principle of networking should thus be extended to incorporate development oriented, community based institutions. Throughout the Latin American region numerous institutions exist that can be seen as 'potential allies' in the extension of disaster prevention and mitigation. One role of the existing specialized centres should in fact be the establishment of working liaisons with such centres, proffering educational, methodological, documentary and research support for their activities. This is the 'tactic' being implemented at present by ITDG in Peru and will be the basis of FLACSO research initiatives in Central America.

Thus, although disaster prevention and mitigation is a specialized area it is clearly an area which is fairly easily accessible to and incorporable within ongoing development oriented research activities at many levels. If this principle is acceptable, then the range and type of institutional partners available is as wide as the range of problems and geographical areas considered in the research agenda.

At a macroregional level, networking at the national or local level has recently been given a new dimension with the formation of the Latin American Social Science Network for the Prevention of Disasters. This network includes ten of the most

important disaster research institutions (or coordinating centres) in the region. The creation of three coordination subnodes (ITDG-for South America; FLACSO for Central America and the Caribbean; and COMECSO for Mexico and North America) comprises an additional effort to promote subregional coordination and stimulus for disaster research. The overall promotion of social research on disasters, the identification of common research priorities and opportunities for joint collaboration in research endeavours and in the distribution of information, are the principle objectives of this network.

It can be suggested here that this network, which will undoubtedly grow with the gradual incorporation of other institutions in the future, is an appropriate point of departure for the channelling of research initiatives in the region.

One final point worthy of consideration relates to the potential for incorporating or widening the social science component of research and promotion in the activities of certain selected basic, physical or engineering science institutions. One fundamental problem of prevention and mitigation has been the ephemeral nature of collaboration between the social and physical and engineering sciences in the disaster area. In fact, a type of "undeclared war" has often existed between the two. However, an attempt must be made to integrate these areas, allowing a more advantageous social use of the information and knowledge on risk factors provided by the physical sciences.

An excellent example of such integration can be derived from the experiences of OSSO in Cali, Colombia where important work has been undertaken with urban communities on risk and mitigation. ITDG in Peru has also consistently conformed work groups with social scientists, geologists and civil engineers. Efforts could be made to identify other potential centres that could be stimulated to take a step towards the formation of integrated, multidisciplinary, research and training institutions.

IV. FUTURE RESEARCH OPPORTUNITIES:

The scarcity of concrete research results in the area of disaster prevention and mitigation, when compared to the magnitude of the disaster problematic and the multiple facets involved in the promotion of adequate disaster planning, makes any discussion of research priorities extremely difficult. This is even more so when the question involves the postulation of "no more than three ideas", as has been suggested by IDRC in

it's request for the present paper. The wide range of 'priority' research topics that could be identified is illustrated by the content of John Rogge's Research Agenda for Disaster and Emergency Management (Rogge, 1992) where over forty different topics are identified, of which Rogge himself prioritizes some twenty-four, acknowledging that "any rank ordering of the multitude of research themes suggested.. will depend to a large degree upon who is undertaking the ordering".

For it's part, the recently formed Latin American Social Science Network for the Prevention of Disasters identified five thematic blocks of priority research questions** and nearly thirty specific research endeavors (Red de Estudios Sociales en Prevención de Desastres en América Latina, 1993). A number of these coincide with Rogge's appreciations but a number of others constitute additions to his Agenda. Finally, in a recent U.S. Central American Seminar on the Socio-Economic Aspects of Disasters organized by the University of Delaware Disaster Research Centre and the Latin American Social Sciences Faculty (FLACSO) and celebrated in San Jose, Costa Rica (January, 1993), some forty research themes were 'prioritized'.

The question thus becomes how do we prioritize priority research issues? How do we phase them temporally and sectorially or thematically? Is research related to prevention and mitigation more, less or equally as important as research on disaster preparation, response, rehabilitation or reconstruction? Or, does relevant research exist which cuts horizontally across these traditionally identified stages or phases of Disaster Planning, accepting that they do not constitute discrete units of social analysis and action?

The response to these questions cannot be separated, amongst other things, from the nature of the individual or institution that prioritizes; their particular position in the Disaster Planning framework (researchers, practitioners, financing agencies, etc.); the particular geographical area, region or country to which we are referring; and the prioritization given to a possibly wide ranging research agenda by the different organizations that are able to promote research at a world, continental or national level, and the need for these to adopt complementary as opposed to competing approaches.

**/ The State, Political Systems and Disaster Prevention; Disasters and Development Models; Disasters and Culture; Organizational-Administrative Models and Disaster Prevention; and, Instrumental Systems for Disaster Prevention, Attention and Recovery.

One recent result of prioritization of research themes is that made by Intertect as a basis for the financing of social science research related to the UNDP/DHA/UNDRO Disaster Management Training Programme. Using Rogge's Agenda as a base line study, the first two requests for project proposals have prioritized five relatively wide ranging research themes:

- i) mitigation implementation, including a study of the factors or conditions that inspire the widespread adoption of mitigation techniques and tools at the community level; and the factors leading to the design and implementation of successful national mitigation policies and projects;
- ii) the medium and long term economic effects of disasters and the factors affecting variations in economic consequences;
- iii) Disaster management ethics; should ethics guide the implementation of disaster management and if so what are the issues that provide guidance to disaster managers seeking answers to ethical dilemmas?
- iv) Disaster management models, their effectivity and the factors that condition their efficacy;
- v) Family, community, institutional a societal coping and response mechanisms, especially during the recovery and reconstruction phases.

With reference to future IDRC research initiatives and priorities we will, in discussing additional options, respect the two generic principles established in the URB GP1 Statement: research related to prevention and mitigation of disasters; and research oriented to environmental management at an urban level. As regards the urban community emphasis and the methodological approaches proposed in terms of action- research at this level, we will flexibilize our approach stepping outside the bounds of these particular emphases.

Prior to detailing our ideas on additional research priorities, however, we should point out that we do not necessarily "share" a prioritization which is limited to disaster prevention and mitigation activities. Thus, although there can be no doubt that a primary emphasis in our research endeavours must be oriented towards the promotion of these activities, the reality of the disaster context is that increasing numbers and magnitudes of disasters will occur in the future. Thus, there also exists an urgent need for research which facilitates more efficient responses and rehabilitation and reconstruction processes at varying societal levels.

More efficient and culturally appropriate early warning systems and social mobilization mechanisms would enormously

reduce human and economic losses. These can be considered not only to be 'preparation' mechanisms but also mitigatory processes (if mitigation is seen to be the process of reducing disaster impacts and losses). On the other hand, for example, some types of relief and emergency response are clearly not conducive to adequate reconstruction schemes or the introduction of mitigation activities in the future. This is particularly so where relief response is based on paternalistic attitudes which may promote the idea that self protection is unnecessary given that someone else will take care of you if a disaster occurs. More research is clearly required on the relationship between relief and rehabilitation activities and subsequent reconstruction and mitigation processes.

Despite these caveats, the IDRC emphasis is unquestionable as such and also when seen from the perspective of other potential or real institutional stimuli to social disaster research. Here, it is clear that the disaster response orientation of a number of international agencies, and the high technology fix of the mitigation response of others, will 'guarantee' the promotion of research on government led response, recovery and structural mitigation. The orphaned child will probably continue to be the area of nonstructural mitigation, and local and community participation.

Beyond the five very important research focii encompassed within the URB GP1 statement and commented in Section II of this document we would venture to suggest three additional research themes which we believe should be given a high priority in the future. These relate to the establishment of a knowledge base and objective conditions for the promotion of socially high impact prevention and mitigation activities.

a. Decision Making Processes and Conditioning Factors for the Implementation of Disaster Planning, Mitigation Policies and Activities at the National, Regional and Local Government Levels.

A continued and concerted effort must be made to use research to promote a widening of government involvement in disaster planning, particularly in prevention and mitigation activities. However, there do exist in Latin America a number of successful experiences in disaster prevention and mitigation (using both structural and nonstructural approaches), and examples of government commitment to broad based disaster or emergency management systems, involving both central government and local level organisations.

The potential for influencing decision making processes is subject to our knowledge of the objective conditions required for placing policy concerns on the decision (or political) agenda and pushing them through to implementation. As regards disaster prevention and mitigation, an implicit or explicit belief seems to exist that it is the cost-benefit equation and the need for short term economic returns that dictate implementation or not.

However, the limited evidence available in the Latin America context would suggest that this is not necessarily the case. Such variables as political expediency; the type of government and the levels of decentralization of decision making; the role of technical experts and consultancies; ethical and professional attributes; and, the impact of major within country disasters or of those in nearby countries, amongst other factors, all can have an influence in changing prevailing attitudes.

For example, a recent study undertaken by the author of this document on the decision making process behind the implementation of the Costa Rican hospital retrofit program clearly showed the importance of ethical, individual, professional and technical factors as opposed to cost-benefit or political considerations (Lavell, 1992). On the other hand, the successful Colombian Disaster Prevention organization, with its articulation of national and local/community levels can in part be explained by the impact of Popayan and Armero and the longstanding tradition of regional, municipal and local level government and organization.

Consequently, we believe there is a need for comparative research on the decision making process behind succesful schemes (and unsuccessful proposals), which provide a checklist of factors, and conditions which can be utilized in the advisory, decision and policy making functions of research institutions. Needless to say, such research could also usefully be undertaken on private sector decision making particularly where this relates to socially sensitive areas (hospitals, educational facilities, energy installations, technologically hazardous industry in highly populated areas, water supply, etc.).

b. Development Initiatives, Environmental Risk, and Human Vulnerability.

High technology schemes in the industrial, energy, infrastructural and building sectors in both rural and urban areas, and migratory patterns and changing land use schemes in environmentally delicate milieus (hillslopes, tropical lowlands

and mountain foothills, etc.) rapidly change existing ecological and physical balances, increasing the incidence of risk factors. Consequently, disasters are more and more conditioned by anthropic factors. This is particularly true with flooding, landslides and drought. Many of the ideas which circulate as regards the human occupancy-risk association are, however, intuitive rather than scientifically based. Thus, for example, deforestation is causally linked to the temporal incidence and intensity of flooding patterns without much real indepth analysis existing on the concrete nature of such a relationship and it's specifications in prospective terms.

Research which clearly demonstrates the links between 'development' initiatives and increased environmental risk at the local and regional level could make an important contribution in policy and decision making terms, especially if linked to the ongoing national and international concerns for environmental management and control. Pragmatically and opportunistically linking disaster risk to ongoing environmental and productivity concerns in urban and rural areas, could turn out to be a convincing policy input deriving from research.

c. The Economic Costs of Disasters and the Cost Benefit ratio of Prevention and Mitigation Activities.

Despite the fact that the cost-benefit ratio of prevention/mitigation versus disaster relief and reconstruction may not be the only or most important consideration in public and private sector decision making, it is of undoubted importance in terms of the development equation as such and the development costs of disasters. It is, thus, an important potential aspect in the decision making process and the move towards public and private agenda status for more widespread prevention and mitigation activities.

To date, calculations of disaster impacts have essentially been limited to those undertaken by international organizations and national governments on the direct short term losses from the larger disasters (see the series of ECLA studies on Latin American Disasters: ECLA, 1973, 1974, 1976, 1986, 1988; and Jovel, 1989). Indirect and secondary losses have rarely been the object of systematic study. Moreover, the direct, indirect or secondary losses from the multiplicity of medium and small scale disasters which affect the region annually have never been given much consideration. However, some evidence exists to suggest that their overall, accumulated impact is greater than that of the large scale events (see Abril Ojeda, 1982). Finally, the impact on the dominant informal sectors of the Latin American economies is rarely given any close consideration. Calculations

are normally based on formal sector losses.

The other side of the coin, as regards disaster impacts and costs, relates to the question of who pays the cost of reconstruction and who benefits from this process. Very little research exists on this theme.

But, if one considers this aspect closely a number of interesting contexts arise. Thus, for example, destroyed or disrupted public sector investments are normally the object of national budgetary allocations or international capital flows. In addition, the extent of insurance coverage and international reinsurance afforded such investments is often not revealed. This should, however, be discounted from the declared cost of reconstruction, given that this is often proffered and inflated with the idea of transmitting the idea of the vast amount of scarce national or international resources which must be diverted to recovery (the problems faced by international reinsurers due to the recent deluge of very large scale disasters is quite another question). This question of financial indemnization is also pertinent to modern sector private investments.

But, who pays the cost of recovery in the small scale, semicommercial, subsistence or informal sectors which account for the major part of the Latin American population?

A greater specification of all of the abovementioned aspects would greatly help in clarifying and making more precise the formula 'development and disasters' or 'disasters and underdevelopment'. Moreover, it could greatly help in specifying which economic and population sectors are effectively 'underdeveloped' by disasters and which may in fact derive medium or long term benefits. Prevention and mitigation may in fact turn out to be more productive in economic and developmental terms when applied to the informal and marginalized sectors than when applied to the affluent or capitalist sectors. The calculated, and generally well publicized relationships between disaster impacts and the size or growth of GNP or the size of the international debt could turn out to be of much less importance than is commonly considered in the overall development equation. After all, a good part of the Latin American economy involves informal productive activities which are ignored in official economic statistics; whereas, on the other hand, it is not at all clear how living standards and the social welfare of the mass of the population is related to the size of the GNP or external debt.

As regards the potential executors of research projects within the above-mentioned fields, the options are clearly encompassed within the institutional frameworks discussed in previous sections. That is to say, 'disaster' oriented institutions and the Social Studies Network, and development oriented, policy formulating institutions with little previous experience in disaster oriented research, but with a proven capacity in the generic themes behind the particular disaster problematics. In the case of the three themes indicated above this would be the case of political science and policy formulation units; environmental impact research centres; and economic analysis units.

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APPENDIX 1

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