

Risk Management and Reduction in the Caribbean: Considerations on the State of the Game and on new Challenges for the Future.

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1. Introduction:

During 2002, UNDP has promoted a Preparatory Assistance-PA-programme entitled the Caribbean Risk and Management and Adaptation Initiative. This region wide endeavour has been coordinated by the Cuban UNDP office in La Habana.

Set against a back drop of acute environmental risk in the Caribbean region, increasing disaster losses, and a relatively long history of organizational and institutional intervention in the problematic at the regional and national levels, the PA has promoted a range of activities that will provide inputs for the formulation of a future, more ambitious UNDP promoted Risk Management and Adaptation Initiative. The Initiative covers the entire insular Caribbean and Belize, Guyana and Surinam.

This Initiative proposes to promote coordination and synergies between different national, regional and international programmes under way or planned in the region and to stimulate improved institutional, administrative, financial and legislative measures that will be capable of making effective the use of the increasingly solid body of information on climate change and other recurrent and traditional hazards in the Caribbean. A further fundamental objective for which UNDP is particularly well geared up to achieve is the expansion of a social perspective to risk management, the highlighting of the risks and needs of highly vulnerable social groups and an increase in the focus on risk and its causal processes rooted or anchored in inadequate development processes.

One of the activities laid out in the PA calls for the development of a data base on organizations currently involved in risk management and on ongoing or planned programmes, projects and initiatives, and for the elaboration of a short document that analyses the current state of the art

with regards to risk management in the region. This would identify the major challenges and areas that UNDP may usefully seek to cover in the future given its particular comparative advantages and experience in the topic.

The present document fulfils this latter requirement.

2. Sources, Method and Limitations.

The present document has been elaborated using three principle information sources. Firstly, information gleaned from the inventory of projects and institutions which preceded it. Secondly, a number of interviews carried out with key risk and disaster management actors in the Caribbean region. And, thirdly, taking into account the conclusions and recommendations that appear in a series of diagnostic studies and strategy statements promoted in the region by other institutional actors over the last five years.

The Project Inventory

The institutional and project inventory was constructed using three principle sources of information- project WEB sites, documentary sources and direct contact with a number of project managers and key actors in the region. The exercise covered ongoing, planned and recently terminated projects. The time allocated to this exercise and the construction of the data base was 30 days. This significantly limited the scope of the inventory making it possible only to identify and document more easily accessible projects where information was readily available.

During the inventory exercise a little over 100 projects were identified. Although we are conscious of the fact that these projects comprise only a proportion of initiatives promoted in the region, at the same time we do believe they are representative of the types of preoccupation and intervention that typify the region as a whole, and include a good part of the more important initiatives undertaken. Many initiatives promoted by national and local organizations, NGOs and others have undoubtedly passed unregistered. Moreover, difficulties were also faced, given the time framework of the project, in identifying projects in the French and Dutch speaking Caribbean.

Of the 100 projects identified, 35 have been inventoried completely and now appear on the Caribbean Risk Management and Adaptation Initiative website. (onu.org/cu/havonarisk). The remaining projects will be subjected

to closer scrutiny and information search and will be placed on the site in due course.

The content of our document is supported by the information gleaned particularly from the 35 fully inventoried projects, but also takes into account the remaining, as yet, incompletely inventoried projects.

In addition to providing information for the elaboration of the present document, the inventory is offered as a service to interested professionals, practitioners and students, hoping to facilitate knowledge on project activity in the region and foster communication and collaboration between different projects.

Interviews with Key Actors

During the inventory exercise opportunity existed to undertake a limited number of interviews with key risk and disaster management experts in the Caribbean region, particularly those located in Barbados, Trinidad and Jamaica. Twenty three persons were interviewed from national disaster organizations, international agencies, NGOs and universities in order to glean information on projects in the region and discuss the state of the game as regards the problematic and future felt needs in the region.

Diagnostic Studies

Over the last five years an important number of studies have been undertaken as regards the risk and disaster management context in the Caribbean, or in its different sub regional or linguistic components. These have been undertaken in general to substantiate proposals as regards future work in the area and in order to facilitate the development of strategic intervention frameworks. The principle studies and proposals consulted include the following:

DIPECHO. 1997. *Diagnostico Previo al Plan de Accion DIPECHO para America Central y el Caribe*. CRED. Louvaine.

Davis, Ian and Franklyn Michael. 2000. *The Capacity and Arrangements for Disaster Preparedness, Mitigation and Post Impact Recovery in the Independent Caribbean Countries and the Scope for DFID Intervention*. Disaster Management Centre, Cranfield University.

Asociacion de Estados del Caribe. 2000. *Encuesta sobre las Fortalezas, Debilidades, y Proyectos de Gestión de Desastres en los Países de la AEC. Puerto España. Elaborado por Nicole Williams.*

Colleymore, Jeremy. 2001. *The Status of Disaster Reduction Initiatives in the Caribbean.* Contribution prepared for the ISDR Global Report on Disaster Reduction. CDERA. Barbados.

Jones, E., P. Bisek and C. Ornstein. 2001. *Comprehensive Disaster Management in the Caribbean. Baseline Study.* Comprehensive Approach for Disaster Management in the Caribbean Project. CDERA,USAID,UNDP.

Bisek, P., E. Jones and C. Ornstein. 2001. *A Strategy and Results Framework for Comprehensive Disaster Management in the Caribbean.* Comprehensive Disaster Management Strategy Project. April.

Caribbean Group for Cooperation in Economic Development. 2002. *Natural Hazard Risk Management in the Caribbean. Revisiting the Challenge.* Discussion Draft. June. Caribbean Country Management Unit, Latin America and the Caribbean Region. The World Bank.

Amongst these documents, the Strategy and Results Framework, developed by CDERA with UNDP and USAID-OFDA support, assumes particular importance with regard to the English speaking CARICOM countries. This Strategy document has been endorsed by CARICOM and a broad consensus exists amongst donors to the region that future proposals should link into the areas of concern identified in the document. With regard to this, recent Canadian International Development Agency-CIDA- funding to the Organization of American States and the Pan American Health Organization has been geared up to the Strategy recommendations. Moreover, the recent World Bank and Caribbean Group for Economic Cooperation review of practice in the region explicitly links recommendations to the priority areas identified in the Strategy document. In our analysis particular attention will be given to the contents of these two latter documents because of their recent and strategic nature.

3. Analysis of the Project and Institutional Inventory and Data Base.

Prior to offering a more comprehensive analysis of the state of the art as regards risk reduction and management initiatives in the region, incorporating the evidence from interviews and diagnostic documents, we

will offer a succinct description of the findings emanating from the inventory of projects and institutions completed as part of the current project. This may be done taking into account three major categories of information- topics or themes dealt with, spatial coverage and levels of territorial resolution and institutional presence and support.

3.1 Themes and Topics.

The risk and disaster problematic offers a very wide array of possible themes and topics that must be dealt with if risk management is to be successfully promoted. These may still be conveniently classified taking into account the so stages of the so called disaster cycle or continuum- prevention and mitigation, or primary risk reduction, preparedness and disaster response, and rehabilitation, recovery and reconstruction. Within each of these broad generic categories a wide number of different activities or topics may be identified, all of which require attention if significant advances are to be made with risk reduction. Moreover, this finer classification of topics is required if the objective of analysis is the identification of possible areas of intervention according to the particular expertise or relevance of different organizations and institutions. A finer classification of types of intervention may be found in the methodological document that guided the inventory exercise and which is reproduced in Annex 1 of the present document. But, for the purposes of describing the results of the inventory exercise and in recognition of the general level of information this presents, our description will respect the broad disaster cycle classification mentioned above. In our next section when integrating inventory results with evidence from interviews and previous diagnostic studies, we will attempt to fine tune the topic approach, identifying more discrete categories or types of concern.

General Considerations

Prior to the 1990s, approaches to disasters in the Caribbean were dominated by preparedness and response concerns. A major impetus for this was the Pan Caribbean Disaster Prevention and Preparedness Project promoted and run by OAS, PAHO and OFDA-AID during the 1980s and which gave rise to the creation of CDERA in 1991. Until very recently CDERA's mandate clearly exclusively related to the improvement of disaster response in the region. Recommendations emanating from the recent Strategy Framework initiative undertaken by CDERA do suggest, however, the need to broaden the institutions mandate including more explicit risk reduction and management mandates.

The risk reduction or disaster prevention and mitigation problematic has experienced a rapid increase in professional and political saliency over the last 12 years. This was stimulated originally by the UN International Decade for Natural Disaster Reduction, whilst increasing evidence that disaster losses were growing rapidly with serious consequences in terms of development potential and lost investment added to the impetus. By the end of the 90s, the very large scale impacts of the 1997-8 Nino, Hurricanes Georges, Mitch and Lenny, the Montserrat volcanic eruption and the Venezuelan mud slides and flooding all opened a window of opportunity for placing the risk reduction topic more firmly in the centre of analysis and concern in the Caribbean, and elsewhere. Finally, during the last five years of the past decade, the increased salience of the climate change adaptation problematic has also had its impact in the region and attention has increasingly been given to the need to bring the risk management and climate adaptation themes and practice closer together.

The increased saliency of risk reduction aspects has been matched by the increased interest in the topic by an important number of donor and development agencies, including the IADB, the World Bank, AID, GTZ and the European Union. The risk reduction problematic turned the corner, as one analyst has indicated, and is now on an increasingly equal status with traditional response concerns. At least this is true as regards externally promoted concern for the problem if not so in terms of investment, practice and national commitment.

Themes and Topics Revealed in the Project Inventory

An analysis of the projects identified in the inventory data base reveals a predominance of initiatives that in a diverse or specialized fashion deal with the risk reduction and climatic change adaptation problematic. These projects are followed in order of importance by those initiated in the aftermath of large hurricanes and following the Montserrat volcanic disaster in the region. These have, in general, introduced the notion of vulnerability reduction, thus taking up on one of the major preoccupations aired in the past in the sense that reconstruction processes in fact reconstruct vulnerability. Traditional preparedness and response themes are to be found in last place amongst projects identified.

The range of projects identified in the inventory probably distorts reality to a certain extent given that there must be many small scale initiatives that were not registered and that deal with the preparedness and response problem. However, the crude data analysis is revealing because it does indicate that there has been a significant advance in disaster prevention and

mitigation or risk reduction themes. Hurricane Georges and Lenny in the Caribbean and Mitch in Central America did a lot to bring the need for such approaches much further into the limelight than ever before.

a. Risk Reduction/Disaster Prevention and Mitigation

The most ambitious projects promoted in the risk reduction area to date are the Caribbean Disaster Mitigation Project-project 1- promoted between 1993 and 1999 by the OAS with USAID/OFDA funding, and its natural successor, the Disaster Mitigation Facility at the Caribbean Development Bank-project 7. These account for around 8 million dollars of international funds. These two initiatives have promoted work in a number of risk reduction areas that may be considered growing focuses of attention in the region today. These include hazard mapping, the introduction of risk considerations in development planning, the reduction of structural risk in buildings and life lines, the use of insurance as a risk transference and risk reduction measure, and the promotion of community and private sector participation in risk reduction. Also of importance in terms of the scope of its thematic coverage is the recent initiative supported by CIDA in the Organization of East Caribbean countries under the name of the Caribbean Disaster Management Fund-project 11. This also takes up on the hazard and development theme and structural vulnerability, moving also in the legislative area and the promotion of more resilient production structures. One or another of the above mentioned topics is in fact the subject of many of the more specialized risk reduction projects identified in the inventory data base.

In addition to the five or six dominant areas of action identified above, coastal areas have been the subject of a number of projects. This is the case with regards to adaptation to climate change as seen in the Caribbean Project for Adaptation to Climate Change-project 2- and in the OECS post Lenny reconstruction project-project 10. The overall problem of global climatic change is the subject of various new projects in the region particularly supported by GTZ, Germany, the World Bank and CIDA, Canada.

b. Disaster Preparedness and Response.

With reference to the disaster preparedness and response themes that have traditionally dominated attention in the region, varied topics are dealt with in different projects. These include long standing concerns for mass casualty management-project 4-, shelter management, training of trainers in

disaster response, storm tracking and institutional strengthening-project 5. More recent concerns relate to the rapid increase in community level preparedness concerns, many times promoted on the basis of hazard mapping and with a dominant bent in favour of the promotion of early warning systems for flooding and land slides-projects 20, 21, 22, 28, 29, 35, amongst others. Although the promotion of local schemes based on hazard mapping exercises would permit a fuller and more explicit consideration of primary risk reduction concerns, the majority of the projects, although alluding to disaster prevention and mitigation, are in fact squarely centred on early warning and preparedness schemes

Clearly in the Caribbean, major concerns have and still exist with regard to hurricane and flood related disasters, whilst geological hazards have not been the subject of major initiatives in general except as regards their study and monitoring. Here, a very strong capacity exists as regards seismic, volcanic, hurricane and flooding risks particularly promoted by the University of the West Indies at Mona, Jamaica and St Augustine in Trinidad, and the Caribbean Meteorological and Hydrological Institute.

In this context, the recent initiative taken by CDERA to promote early rescue training related to urban seismic risks is an interesting development-project 3. Perhaps only in Cuba has there been any major previous sustained interest in the seismic problem seen from the response angle. The earthquake, tsunami and volcanic awareness projects promoted by the Seismic Research Unit at the University of the West Indies with OFDA and CBD support mark major new initiatives in pushing the hazard study area from science into the public response and awareness realms

c. Post Disaster Rehabilitation and Reconstruction Projects.

Post disaster reconstruction is now not only seen as a means of getting society back on the track of normal life but also as a potent means of promoting future risk reduction. Reconstruction is therefore an important facet of risk management, and initiatives in this direction may be seen as windows of opportunity for improvements in the levels of security afforded affected population.

The majority of the projects identified in the inventory and related to post disaster rehabilitation and reconstruction do, in fact, make explicit the intention to reduce future risk in the affected areas and infrastructures. AID financed reconstruction projects post Georges and post Lenny in Jamaica and the OECS countries are particularly explicit on these matters

Other identified projects have dealt with adequate housing structures faced with hurricanes and safer settlement patterns post volcanic eruption in Montserrat-projects 9 and 24 and 17 respectively -, increased safety when faced with post Nino hydro-meteorological conditions in Guyana-project 19-, more secure production in small scale fishing and farming practices - projects 25 and 29-, and more secure potable water systems in Belize-project 30. Other projects have dealt with increased awareness and adaptability amongst children and adolescents-projects 31 and 32- and improvements in coastal storm protection systems.

3.2 Territorial Coverage.

The inventoried projects comprehend different spatial or territorial levels, with a predominance of national and local level projects, followed by an important number of projects or initiatives that are sub regional or regional in scope.

Sub regional and regional projects refer in most instances to English speaking Caribbean countries. This reflects the dominance of these countries in the Caribbean and the singular existence of CDERA, the regional organization established by the CARICOM nations to deal with disaster response. Within the English speaking Caribbean, the Organization of East Caribbean States has a more pre-eminent position in inventoried projects.

Different language speaking blocks tend to be rather hermetic and little exchange of information or joint experience in project implementation exists. Despite the proximity and relevance of Central American experiences, and the established collaboration agreements between CEPREDENAC in Central America and CDERA and the ACS, only a limited amount of exchange, joint venture and mutual learning and experience exists to date. Undoubtedly, this may be explained by the language differences but also by cultural gaps and differences.

3.3 Institutional Presence. Implementation and Financing.

The majority of the projects inventoried have been financed by a relatively limited and repetitive number of financing organizations. These organizations and institutions include OFDA-AID, AID, DFID-United Kingdom, UNDP, GTZ-Germany, the World Bank, the Inter-American Development Bank, and CIDA-Canada, with contributions from other European governments such as Norway, Italy, France and the European

Union itself through its programme, DIPECHO. This in itself is not surprising given that these are the major supporters of risk and disaster activities in the hemisphere as a whole. However, this predominance of international agencies does underscore once more the high level of dependence on external sources. This is particularly the case with risk reduction or disaster prevention and mitigation. It is clear from the project portfolio that as yet, in general, national governments have still to buy into the risk reduction problematic in any important way.

As regards the implementation process, this has generally been achieved with the presence of official government or university institutions and larger NGOs in the English speaking Caribbean. With the exception of Cuba, this contrasts markedly with the Spanish speaking islands and Central America where there is a far greater presence of international and national NGOs. This probably reflects the nature of civil society-government relations in the two broad groups and the inherently greater levels of skepticism as regards governments in Spanish speaking countries, both on the part of civil society itself and on the part of many financing agencies. With the exception of a number of large international NGOs and Christian based groups, the English speaking Caribbean has a very under-developed NGO culture.

4. The State of the Art as regards Risk Management Topics and Concerns

In the present section we will attempt to succinctly analyze where we are in the Caribbean with different risk management concerns, building on the project inventory information and incorporating the results of interviews undertaken and the conclusions of the series of diagnostic studies previously mentioned. Due to the nature and time framework of the risk inventory and analysis project, our analysis identifies general as opposed to specific country based conclusions. Here, it must be accepted that the region shows a good deal of heterogeneity as regards the development of particular topics.

4.1 Particular Themes and Topics.

Hazard Analysis and Prognosis.

Scientific analysis of hazards and, more recently, local based initiatives to dimension hazard and construct hazard maps are reasonably well established in the region. And, an increasing use of GIS systems may be

found in many islands. University of the West Indies research centres such as the Seismic Research Unit at St Augustine, Trinidad, with major projects and activities in the areas of seismology and vulcanology, and the Disaster Research Centre at the Geology and Geography Department at Mona, Jamaica, with work on flooding, landslides and hurricanes, have made major contributions to this area. Both offer courses on such topics. In the area of hydrology and meteorology, the Caribbean Hydrological and Meteorological Institute has done much work on hurricanes, flooding and drought, whilst the recently terminated CPACC climate change project undertook studies of coastal vulnerability to sea level rise. Within the Spanish speaking Caribbean, Cuban university centres and government institutions have constantly covered the hurricane, flooding and earthquake areas.

Despite the attention paid to hazard analysis, much needs to be done as regards hazard micro zonification, multi-hazard analysis, including a consideration of technological, complex and concatenated hazard scenarios, and in the critical areas of social communication and the promotion of the use of such information in sectorial and territorial planning and project development. Local level schemes for hazard monitoring need to be given far more attention.

To date, hazard research has tended to be scientifically rather than socially informed. Advances in dimensioning the hazard problem from a social needs perspective can be seen with recent University of the West Indies, Seismic Research Unit projects, financed by OFDA-AID and CDB, on awareness to seismic and volcanic hazards, with IADB support to the Dominican Republic in improving the social communication of hazard information, and in Cuba where much work has been done in this area and early warning has had excellent results in saving people and livestock during hurricane events.

Vulnerability and Risk Analysis.

Vulnerability is part of the lexica of risk and disaster in the Caribbean as elsewhere. However, the work done in this area and the complexity this attains leaves much to be desired. Scientific hazard analysis is far more developed than integral vulnerability analysis. Notions and work on vulnerability and vulnerability indicators is dominated by structural vulnerability considerations, whilst more integral approaches including consideration of economic, social, organizational, ecological, educational and institutional vulnerability have not as yet received adequate attention. Vulnerable structures dominate attention and not vulnerable people.

Integral risk analysis has also received little attention, whilst risk scenario construction and attention to basic risk causal factors and processes is almost completely absent. At present it seems that hazard is analyzed without reference to society and vulnerability is added on but without achieving an integral vision of the complexity and specificity of risk as a concept, category and empirical reality. Objective scientifically based ideas on risk are not complimented with subjective notions and the analysis of different social perceptions and readings, ordering and prioritization. These are essential in the transition from risk analysis to risk reduction decision making and risk reduction measures.

The dominance of structural visions of vulnerability can be explained in good part by the dominance of science and structural engineering caucuses in the region and the absence, as in many other regions, of a fully fledged and developed social science community working on risk and disaster from a development and social transformation perspective. Analysis of disaster risk must progress and an attempt must be made to examine this in the light of life style, development deficit, type risk. This is essential if risk, disaster and development are to be brought closer together analytically, and in terms of the development of action frameworks, strategies and instruments.

Environmental Management and Hazard Control and Prevision.

It is now commonly accepted that environmental mismanagement can and very often does lead to the transformation of existing resources into environmental hazards. Degraded environments generate new hazards or accentuate the impacts and damage potential of existing ones. Environmental management thus becomes a means for risk reduction by preventing new hazards or by maintaining the natural protective capacity of sane and resilient ecosystems.

The Caribbean has suffered extensive degradation of its natural resource base including coastal ecosystems with consequent negative risk impacts. Although awareness exists as to these processes, and despite moves in countries like Jamaica, Trinidad and Dominicana to incorporate hazard reduction processes in environmental management activities, this is an area where considerable attention should be paid especially given the impacts that can be expected from global climatic change on ecosystems and resilience. Land use planning is an obvious point of convergence of risk reduction through environmental planning, and the link should be strengthened or promoted.

National Risk Management Systems.

The increased saliency of the risk reduction and management problematic and the recognition that it brings into play a new and wider series of institutional, organizational and individual actors than are involved in the disaster preparedness and response scene has inevitably led to demands for new structures, policies and programmes which may promote and make risk reduction effective. Risk reduction basically requires the incorporation and commitment of development, environmental and sectorial and territorial planning actors. That is to say, actors that are part of the causal processes that lead to risk, and those that must manage the decision making and planning processes that may help reduce or control risk in the future.

The search to create new or broader institutional structures has played itself out between a widened role for traditional response organizations and the creation of new, risk reduction oriented structures linked to development and environmental planning. Where new structures have been favoured as the solution, the notion of risk reduction and disaster management systems has dominated to date, with examples of legislative reforms favouring these in various countries in Latin America. This includes Colombia and Nicaragua as well as countries like El Salvador that have recently created new risk reduction institutions outside of the traditional response organizations.

In the Caribbean region the only countries that have entered into a wide ranging discussion as to the need for a new risk and disaster structure are the Dominican Republic and Haiti, where externally financed projects-IADB and UNDP- have led to the development of ideas and draft proposals for change. These have as yet had no real impact on prevailing, response dominated structures and in fact such new structures usually face opposition from those that run and support these traditional response organizations. Consequently, with the exception of Cuba where risk control is fairly well embedded in institutional structures, the rest of the Caribbean is still dominated by response structures with little real attempt to provide an institutional basis for risk reduction. Recently, it has been proposed that CDERA, the traditional CARICOM regional organization responsible for stimulating improvements and leading regional disaster response, be reformed to widen its mandate to include risk reduction. But, to date, no definitive move has been taken on this front and a vacuum still exists as regards the coordination and promotion of risk reduction initiatives in the public and private sectors.

Finally, the advent of a new and growing preoccupation for adaptation to climate change has introduced new institutional structures and concerns, professional resources and financial mechanisms. Here there is a new danger that similar or complimentary concerns as regards risk associated with hydrological, meteorological and sea level change factors will be taken on by both risk management organizations and climate change adaptation institutions but with insufficient coordination and cooperation between the two. Work must be promoted that brings these two types of institution together using common methodological, strategic, policy and instrumental frameworks and means.

The rationale behind the idea of new institutional structures is not hard to grasp given the very different actors involved in the risk reduction problematic. Moreover, good practice and experience with these reforms exists. The problem of change relates more to the need for political will and awareness than to any problem of how to do this. This signifies that considerable work needs to be done in convincing and bringing on board key decision makers from government, sectorial and territorial development agencies and the private sectors, as well as regional and local authorities. New institutional structures will also have to be accompanied by broad and enforced policy statements and norms relating to risk reduction, applicable to public, private and international sector projects and finance.

Local Level Risk Management.

An essential component of risk reduction and risk reduction management frameworks is made up of local level initiatives. Risk is manifested locally and constructed through the concatenation of multiple complex social processes deriving from decisions taken at multiple territorial levels. Disaster is also most adequately measured and analysed at the local level where damage is experienced in a palpable fashion and the first organized response always occur.

To date in the Caribbean, local level initiatives have predominantly been construed in the framework of external interventions that provide conditions for local level hazard mapping, some vulnerability analysis and the development of early warning systems. This is particularly true with regard to flooding and landslide hazards. Few schemes promote real and active local participation and little has been done to attempt to create or fortify local level institutions and organizations for local level risk management, particularly when this is integrated into structures and

schemes for local level development promotion. Local and community based schemes introduce things, but don't really consider appropriation of these by local actors and sustained structures for the continuous management of risk within development and environmental frameworks.

Exposition, Location, Land use and Territorial Planning

Location in zones prone to impact by physical events is a necessary precondition for talking of and analyzing hazard, vulnerability and risk. Where there is no exposition to hazard, there clearly is no vulnerability or risk possible. Territorial and land use planning clearly need to consider the optimum use of land taking into consideration the susceptibility to damaging physical events. Reducing exposition is an obvious first step in risk prevision and reduction.

In the Caribbean, as commented previously, much work has been done on hazard analysis and on the spatial patterns of hazard incidence, although much needs to be done at more micro and local levels. However, very little hazard information is introduced into territorial planning exercises. The links, information flows and joint decision making required between planning agencies and hazard information producers is not in place in general in the region. Information on the local incidence of hazards is more likely to be used for early warning systems than for prospective risk management activities. This process of integration is far more likely to be achieved where hazard information is generated not as a specialized and separate concern, but rather as a part of sectorial and territorial planning activities. Moreover, to the extent local level initiatives can be promoted and strengthened for integrating risk analysis into local development planning and activities, more is the likelihood hazard information will be taken into account. Information generated for multi use purposes and with no specific permanent demand sector is a very different thing to information that is generated according to real and concrete demands. Creating these demands is probably as important as generating the information itself.

Structural Engineering Hazard Mitigation and Building Codes

The English and French speaking Caribbean have a long history of concerns for the structural safety of buildings and the development of building codes and control mechanisms. This commenced with the development of the CUBIC norms in the 1980s, PAHO work over the last 15 years on the structural safety of health facilities, the development of building codes for the OECS nations, and innovative controls in French

speaking countries based on the use of Napoleonic code legal attributes and insurance premiums and coverage. This well established area of concern has been given more recent impetus with World Bank financed work in the Dominican Republic during 2001-2002, recent moves to finance the updating of the CUBIC norms with potential CIDA support, and the beginnings of an ACS project involving the University of the West Indies, the University of Costa Rica and Italian universities. Work in this area has been facilitated by the very high level of structural engineering teaching and practice at universities in the region, the existence of highly reputable consulting firms and regional consultants, and the interest in the topic on the part of certain economic and infrastructure sectors such as electricity and tourism.

Despite the long standing interest and work in this area, building standards are in general deficient in the region as a whole, with notable exceptions in the French speaking Caribbean, Cuba, a number of the East Caribbean countries and the British Virgin Islands. A major problem still exists as regards implementation and monitoring of codes and building practices. Moreover, a significant part of the Caribbean population falls outside of the formal building markets due to their poverty status. Additionally, with the exception of electricity infrastructure much needs to be done as regards structural vulnerability in life lines and critical facilities. Essentially the problem of control may be seen as a political and public policy problem as opposed to a technical and monitoring problem. Without political support and decision little will be achieved such that new initiatives must also contemplate increased awareness and commitment amongst decision makers.

Insurance, Risk Reduction and Risk Transfer

Insurance as a means for risk transfer and reduction has become an increasingly debated and studied aspect of the risk management field. This has been promoted particularly by the World Bank and other international financial institutions. The debate includes the use of insurance for public and private assets, buildings, infrastructure and production. A number of insurance companies in the region have developed considerable interest in the problem and have contributed with risk reduction promotional methods and the search for risk reduction incentives.

Although clear examples exist of government and private sector insurance coverage of critical assets, of regulatory mechanisms, of pooled contingency resources and attempts to use insurance premiums as a means

to guarantee more secure structures, the overall, general, picture allows a great deal of room for improvement. At present cost considerations and the inherent logic of the reinsurance business work against the use of insurance. This is obviously far more critical in dealing with low income families and informal sector assets.

Clearly the need exists for the development of innovative schemes that break down existing resistance and that satisfy the profit needs of insurers at the same time that incentives for risk reduction are achieved. This may require getting out of existing mind sets and searching for innovative schemes that bring together stake holders from the insurance, investment and financing, and owner sectors along with local and national government representatives.

4.2 Some General Considerations

Caribbean nations show a good deal of heterogeneity as regards the acceptance, promotion and implementation of risk reduction and disaster management initiatives. This can be seen not only between different country language groups but also within these. Little cross cultural, language exchange of experience and learning takes place. Moreover, there is little cross fertilization of experiences between the Caribbean states and a proximate area like Central America. Many opportunities for mutual exchange of experiences, methodologies, instruments, conceptual frameworks etc. are not taken advantage of, and much reinventing of the wheel probably exists.

A global analysis shows that a certain defined number of topics are particularly long standing, well entrenched and developed. These include science based hazard analysis, structural engineering and building safety concerns and national and local early warning systems. Recently, following Hurricanes Georges and Lenny and in the face of projections as to sea level rise and the impact in coastal areas, such areas have been subject to increasing attention as regards mitigation and adaptation

The particular dominant interests seen in the Caribbean may be explained in good part by the types of professional expertise and institutional interests built up over time. These are in general reasonably conservative in outlook and dominated by formal science and professional practice with a limited number of professional groups dominating the risk and disaster scene. These include the geoscientific university community, the structural engineering caucus and the response community led by CDERA and including traditional actors such as the national disaster organizations and

the Red Cross. These still represent dominant demand sectors and tend to have ongoing relations with established financing agencies following now well established concerns.

Very little attention is given to local level interventions, although these have tended to increase recently with the impetus given by DIPECHO, OFDA and UNDP in particular. A recent inventory of local level risk reduction initiatives in Central America revealed over 130 projects ongoing or recently terminated. This is way beyond what may be found in the nearly 30 Caribbean basin countries. Here, the relative absence of a dynamic NGO community in the region in this topic may explain why local level work is relatively under represented, both in terms of strict disaster management concerns and also the links between risk and development. A further contributing factor may relate to the fact that many English speaking countries do not really have any well developed local government structures.

The sectorial and territorial development sectors have as yet to get fully involved in the problematic, and little experience exists beyond that with the Caribbean Mitigation Project in bringing the risk and development sectors together. The recent DMF at the CDB is expected to strengthen this aspect, but much still remains to be done. Examples of good practice can be taken from the British Virgin Islands and Montserrat following the eruption of Mt Souffriere.

In general, it may be asserted that social science approaches and frameworks are severely lacking. Engineering and basic sciences along with logistical aspects dominate the horizon. Little research on social aspects occurs and not one university or private sector institution may be identified that concentrates on risk and disaster problems seen from a broad and holistic, multidisciplinary angle. Risk and disaster are not generally considered from the political, sociological, economic, and cultural angles. Social communication as the basis for change is not well covered. In general the low level of overall acceptance of risk management tenets may be explained by the dearth of social approaches and work that attempts to raise the social and political relevance of risk reduction topics. At present political persuasion is in the hands of a limited number of professional crusaders.

5. Opportunities and Priority Areas for UNDP.

5.1 Conditioning and Contextual Factors

UNDP may be seen to have comparative advantages for intervention guided by the following types of concern:

- Networking and regional and interregional approaches that cut across cultural, geographic and linguistic boundaries.
- Brokerage and promotion.
- Searching to promote synergies between different initiatives.
- Linking risk reduction to sustainable development initiatives.
- Information and knowledge generation, systematization and diffusion.

These types of activity can be examined in the light of the different types of needs that must be covered in order to promote and implement risk reduction schemes. These can succinctly be described as following-

- Reliable knowledge on the physical parameters of risk, on vulnerability patterns and components and as regards the underlying social processes by which risk is constructed.
- Knowledge of the particular manner in which disaster risk relates to the development problematic and on the relations between the problems of human insecurity associated with under development and the causes and incidence of disasters.
- Knowledge on the distinct ways in which different stake holders, affected population etc are cognizant of, perceive, read, dimension or prioritize the existing risk problem and place or not the problem on their political and action agendas.
- The development of strategic intervention frameworks that identify the most appropriate and feasible actions to be taken in lieu of risk reduction. This requires a full knowledge of the range of possible actions and strategies including structural solutions, land use planning, environmental management and ecosystem recovery, production diversification schemes, educational and public awareness, legal, organizational, institutional and normative structures and changes at national, regional and local levels, amongst others.
- Sensitization and technical and political commitment to risk reduction, prevision and control, including the development of policy frameworks that promote and require the introduction of risk

reduction concerns in sectorial and territorial planning and project development processes.

- Human resource development and financial support mechanisms for promoting schemes.

The achievement of these types of activity also requires the development of instruments and methodologies to support them. The capability to access information and knowledge on best practices and on previous experiences in order to provide an adequate milieu for the postulation and discussion of innovative solutions is also of great importance. The latter requires agile networking activities and the ability to access information and knowledge, breaking down existing regional, cultural and language borders.

Seen from the perspective of future UNDP promoted activities that compliment or establish synergies with other on going initiatives in the region, these should derive from a crossing over or comparison of the institutions comparative advantages with the types of activity that need to be promoted. This process must also carefully consider the thematic areas identified for promotion in the CDERA Regional Strategy Framework and which has already been taken into account by other donors and project promoters. The priority areas identified in the Strategy document can be summarized in the following manner:

- Stronger regional and national institutions to promote Comprehensive Disaster Management-CDM.
- Curricula and programmes at regional tertiary institutions to support hazard management and links to environmental management.
- Regional research and technology institutions with established capabilities including access to the latest technologies in hazard assessment, mapping and warning systems.
- Research applied to specific local circumstances and widely available information on hazards, vulnerabilities and protective measures.
- Major donors to the region adopting consistent policies requiring the attention to hazard assessment and mitigation measures in project approval.
- Organizations representing key economic sectors actively promoting CDM to their constituents and on their behalf.
- Insurance and finance industries actively supporting CDM.

- Disaster management legislation supporting CDM.
- Comprehensive disaster management plans in place.
- Emergency operations centres adequately equipped and operational.
- Life lines and critical infrastructure protected with mitigation measures.
- Mitigation included in response, recovery and reconstruction actions.
- Physical planning that includes considerations of hazard and vulnerability information.
- Policy and decision makers in the public and private sectors are well informed about CDM and its implications for economic growth and political stability.

The areas identified in the Strategy framework relate to CARICOM countries but may also be seen to be of relevance to the larger Caribbean area.

As commented above, these strategy recommendations have been taken into account in the design of the recent CIDA support to the OECS countries. Moreover, they are also explicitly referred to in the World Bank review recommendations recently completed. This review is perhaps the most comprehensive to date and covers both English and Spanish speaking Caribbean countries. The approach and concerns adopted in this document relate only to risk reduction concerns leaving aside disaster response and preparedness. The Programme of Action put forward in this document places emphasis on the following objectives:

- Identify and support regional centres of expertise for hazard mapping, vulnerability assessment and natural hazard impact assessment and develop common regional methodologies for achieving this
- Identify regional centres to strengthen building practices, to harmonize existing legislation and to develop appropriate enforcement mechanisms.
- Strengthen implementation and enforcement capacity for building codes and physical development standards within the region.
- Update the Caribbean Uniform Building Code and include provisions to address adaptation to climate change
- Develop a mechanism for integrating public and private sector risk management information and experiences.
- Identify regional and national clearing houses for hazard information, develop open sharing and distribution mechanisms for

hazard information, for governments, the private sector and the public in general.

- Integrate hazard risk management into development decision making through planning and budgeting, with emphasis on the impacts of decisions and resource allocations on critical facilities and in low income communities.
- Adopt national building codes, physical planning acts and corresponding administrative and enforcement mechanisms.
- Establish public and private sector incentives for proper risk management, such as insurance premium reductions and tax incentives.
- Understand and define limits of public sector responsibility for hazard risks.
- Address the special vulnerabilities of low income communities.
- Develop risk pooling mechanisms at the sub regional and regional levels.
- Strengthen oversight of the insurance industry and rationalize market.
- Strengthen commitment to risk management considerations in all funded activities.
- Coordinate risk management activities in the region with other donors and lending institutions using the CDM framework.

5.2 Possible Future Areas for UNDP Intervention

Taking into account the information gleaned from the inventory and documentary sources consulted, and considering UNDPs particular comparative advantages, the possible areas for future intervention include the following:

Education and Professional Training

Attention must be given to the promotion of educational opportunities for the study of **integral** approaches to risk management that take the environmental and development problematic as axes and are developed in multidisciplinary frameworks. At present, the major gist of attempts at curriculum development are still disciplinary based and specialized-study of hazards, structural engineering, Geographical Information Systems, etc. The promotion of integrated schemes would need a far greater involvement of social scientists, development and environmental specialists in particular. Given the dearth of this type of professional involved in risk and

disaster work in the Caribbean important efforts will be needed to bring these on board. This in itself is a major educational challenge that will need to be faced.

Various institutions could possibly be the bases for such efforts. This includes Geography at the University of the West Indies, the Institute for Social Studies and the Centre for Sustainable Development where embryonic interests in the risk and disaster problematic already exist. A particular emphasis that could be given to these initiatives relates to the linking of the climate change adaptation problematic with the general risk management problematic. This is especially important in the Caribbean due to the pervasive impact that climate change and sea level rise will have.

Educational opportunities should possibly be developed in the first instance at a Diploma level with possible Masters coming later. Moreover, more immediate curriculum reform could be promoted in various university careers such as sociology, geography, economics and environmental planning providing a professional basis for advances in the promotion of integral education schemes at the post graduate level.

Integrating Risk and Development and Risk Management and Adaptation Considerations.

Risk management as an evolving practice suffers from various problems that limit its effectiveness and impact. One of these is the lack of adequate integration with complimentary and clearly related areas of social concern.

Two very obvious areas are the development problematic and the climate change adaptation problematic.

a. The development problematic

The whole issue of integrating risk reduction into development planning at the national, regional and local levels must be taken up with more force and conviction. This will require work at the political level, sensitizing decision makers as to the short, medium and long term rewards of advances in these areas. In addition, middle level decision makers and both professional and technical staff at sectorial and territorial development agencies must be brought on board with regard to the dimensioning of development schemes with risk prevision criteria. A major requirement and one that would have a demonstration impact on national actors is for UNDP itself to assure that its

development proposals are dimensioned with risk reduction and prevision criteria.

At present some advance has been made in certain sectors such as health, tourism and the electric industry but the general situation is very far from being optimum. Even obvious needs such as incorporating hazard and risk scenarios in land use planning are still relatively scarce. Moreover, much work needs to be done as regards local level risk reduction initiatives seen in the framework of local development planning and decentralization. This requires work with local authorities and technical staff and schemes must stimulate participatory approaches. More dynamic and inclusive risk analysis must be promoted that look at risk factors in the light of development processes and trends and the social actors involved. Static hazard and vulnerability analysis needs to be complimented with more dynamic risk scenario analysis.

Facilitating experiences gained in Central and South America with local level interventions in particular may be an area worthwhile paying attention to whilst any advance in integrating risk reduction parameters in development projects will require both the development and diffusion of guidelines and methodologies (see later).

b. Risk Reduction and Adaptation to Climate Change.

Clear parallels exist between risk management concerns relating particularly to hydro-meteorological phenomenon and climatic variability and the global climatic change and adaptation problematic. But, these two areas are still basically separated when it comes to problem formulation, strategy development, planning and intervention. Advances have been made in the Caribbean with for example relationships between the CPACC initiative and CDERA, but in general these two problem areas are still treated separately and have their own professional supports and institutional mechanisms.

UNDP has promoted discussions on the synergies and relationships between these two areas, including the recent workshop on the topic held in Cuba in June within the framework of the Risk Reduction initiative, and this is a clear area where more work must be done. UNDP is in an optimum position to achieve this, promoting common institutional frameworks and the development of joint national programmes for risk reduction. Work could also be promoted in developing common methodological frameworks for the analysis of risk taking into account different time frameworks and as regards the relations between short term and medium and long term risk.

Local level initiatives must be promoted where long term risk adaptation is seen as part of a continuous process of short term adjustments and reduction methods.

c. Vulnerability and Risk Scenario Analysis

The topic of vulnerability, vulnerability indicators, risk and risk scenarios are not well developed in the region. Traditional structural vulnerability and hazard mapping schemes still dominate. Thus, much work needs to be done to bring on board newer and more innovative approaches that consider risk and vulnerability in a more integral and social fashion. This and other topics are far more developed in Latin America and in Central America in particular. Here there is an opportunity for more networking between these areas and the promotion of cross fertilization of ideas and the development and use of methodologies, including the DESINVENTAR software developed in Latin America and now officially adopted by CEPREDENAC in Central America and the ACS in the Caribbean. Moreover, advantage should be taken of the OAS initiative in developing vulnerability indicators that is now receiving support from the Disaster Mitigation Facility at the Caribbean Development Bank.

Greater links and exchange of perspectives could be fomented between Central America and the Caribbean. A breakdown in the language and cultural barriers may be attempted.

b. Local level risk management.

To date, local level interventions have been directed from above and concentrate on limited sectorial or thematic topics. This is the case with early warning systems and flood plain hazard mapping. A clear challenge exists with regard to the promotion of more integral risk management practices at the local level, with the active participation of local groups and with strengthened local organizations assuming a dominant role and appropriating the process for themselves. This should be achieved integrating risk reduction and development considerations at the local level as indicated when discussing the risk development link above.

c. Networking across geographic, cultural, political and linguistic groups.

Risk management advances and developments, experience and innovation; have been achieved in different geographical regions and by different organizations and institutions. Advances are heterogeneous and different

regions and organizations have advanced in different areas. Thus, for example, Central America has innovative experiences with local level risk management, early warning systems for flooding and the dimensioning of development practices with risk reduction considerations, whilst the Caribbean is strong in hazard analysis, hurricane warning systems and the development of building codes. However, very little networking and interchange exists between different geographical areas, cultural zones and linguistic groups. This many times leads to a constant reinventing of the wheel and a severe sub utilization of accumulated knowledge and skills of relevance in general or subject to modification and adaptation to different national and local conditions

UNDP has had the advantage of working in many different regional settings and with a broad range of different organizations. This places it in an optimum position to stimulate networking and provide forums for discussion, interchange of experiences and collaboration between different organizations and groups.

d. Information networks and the systematization of experiences.

A corollary of the promotion of more wide scale networking can be found in the more wide spread diffusion of risk management concepts, knowledge and experiences. Once more, linguistic, cultural and geographical barriers have impeded the wide scale exchange of this type of information. A further factor relates to the severe lack of systematization and diffusion of best practice experiences in such areas as local level management, land use planning, the introduction of risk criteria in development planning etc.

UNDP is in an optimum position to promote or provide increased capabilities for information exchange and systematization of experiences. Translation of relevant materials between English and Spanish, the development of WEB sites, the promotion of comparative systematizations of experiences, virtual and in site discussion and exchange may all be considered.