A Climate Risk Management Approach to Disaster Reduction and Adaptation to Climate Change

UNDP Expert Group Meeting
Integrating Disaster Reduction with Adaptation to Climate Change

Havana, June 19-21, 2002

United Nations Development Programme

CONTENTS

Abbreviations

CCA	Common Country Assessment
ENSO	El Niño Southern Oscillation
GCC	Global climate Change
IDNDR	International Decade for Natural disaster Reduction
IPCC	Intergovernmental Panel on Climate Change
SIDS	Small Island Developing States
UNDAF	United Nations Development Assistance Framework
UNFCCC	United Nations Framework Convention on Climate Change

EXECUTIVE SUMMARY

Disaster losses and unsustainable development

Disaster occurrence and losses associated with extreme and increasingly not so extreme climate events have increased dramatically in recent years. While many of the emerging patterns of disaster risk are associated with natural hazards that show no tendency to increases in magnitude and recurrence, human interventions in the natural environment are generating new socio-natural hazards, mainly associated with climate events. In many incidences of new flooding, landslide, drought, forest fire and coastal erosion, environmental degradation has transformed natural resources into new hazards. At the same time, the social, economic, territorial, physical and political vulnerability of populations in many developing countries continues to worsen weakening their capacity to absorb the impact of, and recover from extreme climate events.

Rapidly increasing levels of disaster losses are beginning to outweigh development gains in a number of countries. This is particularly the case in the small island developing states-SIDS. It is now very clear that flawed development and environmental practices are at the root of much of the new disaster risk. The achievement of the UN Millennium Goals, in areas such as poverty reduction, health and education will be impossible unless concerted efforts are made to manage and reduce the disaster risks associated with potentially damaging climatic events.

Global change, complexity and uncertainty

Processes of global change are adding new and even more intractable dimensions to the problems of risk accumulation and disaster occurrence and loss, associated with climatic events. Due to global change rapid and turbulent changes in risk patterns in a given region are rarely autonomously generated and may, in numerous cases, be caused by economic decisions taken on the other side of the globe. This territorial complexity of causal factors extends down to include the impacts of national, sectoral and territorial development policies on regions and localities.

The scientific evidence that climate is changing due to greenhouse gas emissions is now incontestable. It is equally well accepted that climate change will alter the severity, frequency and spatial distribution of climate related hazards. However, even while modelling of the linkages between global climate change and particular extreme climate events becomes increasingly sophisticated, it is still not possible to predict with any degree of confidence how particular climate events, in specific locations will behave in the future. Even with regular and much better understood climate phenomenon like ENSO, considerable regional and temporal variations in impacts are observed from event to event.

Humans have gradually and spontaneously been adapting to the variations in climate but the rapid accumulation of climate related risk in recent decades and the resulting patterns of loss, point to a loss of effectiveness and even breakdown in spontaneous adaptation. As the range of hazards and vulnerabilities faced by any given community increases, it often becomes possible only to play one kind of risk scenario off against another in search of a “less worse” scenario. The processes of global change have stacked the odds even higher against successful adaptation. As the causal processes of risk become increasingly global, the options available to local communities and other local stakeholders to influence risk generation processes becomes restricted, if not non-existent.

Risk management strategies

Different approaches to manage and reduce climate related risks have been attempted by the humanitarian, development, environmental and climate change communities.

Since the 1970's the discourse within the broader disaster risk management community has undergone a gradual paradigm shift from response to improved response preparedness to hazard mitigation to vulnerability reduction to integrated disaster risk management. The risk conscious development community has also attempted to promote more integrated schemes where risk considerations are factored into development programs. And, the environmental community has increasingly seen the relevance of environmental management and good resource use for hazard control and reduction.

However, despite the awareness raised by the UN International Decade of Natural Disaster Reduction (IDNDR) in the 1990's, disaster risks have continued to accumulate. Most national and international efforts continue to be fundamentally preparedness and response focused. A large number of successful experiences, however, in Asia, Latin America, the Caribbean and Africa, in which different risk management approaches were piloted, have built up a substantial body of knowledge on the theory and practice of risk management. These experiences provide a glimpse into the future of risk management, if they were to be mainstreamed and applied as part of an integrated programme.

In parallel, the scientists and organizations examining the problem of global climate change have gradually expanded their approach from an initial concern with the causes of climate change, through a concern with modelling its potential effects. For example, in terms of sea level rise and desertification, towards a concern with how societies and economies can adapt to changing climatic conditions. In programme terms, this has led, on the one hand, to international efforts, through the UNFCCC, to mitigate climate change through reduction of green house gas emissions and on the other hand to the assessment of countries' vulnerabilities to climate change and the design of adaptation strategies. In recent years, there has been an increasing commitment to and emphasis on adaptation rather than just mitigation.

In the same way, however, as the disaster risk management community has failed in practice to substantially move beyond response and preparedness, the climate change community has not yet been able to move beyond fairly theoretical formulations of vulnerability and adaptation, towards concrete plans and programmes of action.

In many developing countries totally separate institutional systems exist for promoting adaptation to climate change on the one hand and disaster risk management on the other hand. The efforts to design strategies to adapt societies to the effects of climate change and national and international efforts to manage the disaster risks associated with extreme climate events remain fundamentally divorced. At the international level, it is only recently that a search for synergy between objectives and institutional frameworks has been sought with regard to the UN Environmental Conventions on wetlands, biodiversity, global climatic change and desertification.

The lack of capacity to manage and adapt to climate related risks is already a central development issue in many developing countries, particularly in SIDS. And the lack of capacity to manage the risks associated with current climate variability (on a season to season and year to year basis) is the same that will inhibit countries from addressing the future increases in the complexity and uncertainty of risk due to global climate change. In a way, the entire potential of the future already exists like a seed in the present moment. Strengthening national and local capacities to manage climate-related risks, as they can be understood now, is the best strategy to be able to manage more complex climate risk in the future. It is also more feasible to mobilise

national and international political and financial resources to manage an existing risk scenario than to address a hypothetical future scenario. Medium and long-term adaptation must begin today with efforts to improve current risk management and adaptation. Lessons from current practices along with the notion that learning comes from doing are of critical importance.

Integrated climate risk management

Integrated climate risk management, as a concept, would address both the hazards and vulnerabilities which configure particular risk scenarios and would range in scale from actions to manage the local manifestations of global climate risk, through to global measures to reduce hazard (for example, by reducing greenhouse gas emissions) and to reduce vulnerability (by increasing the social and economic resilience of vulnerable countries such as SIDS, for example). Integrated climate risk management would need to include elements of anticipatory risk management (ensuring that future development reduces rather than increases risk), compensatory risk management (actions to mitigate the losses associated with existing risk) and reactive risk management (ensuring that risk is not reconstructed after disaster events). Moreover, it will have to take into account both potential impacts on socio-economic and environmental systems.

Integrated climate risk management could provide a framework to allow the disaster community to move beyond the still dominant focus on preparedness and response and for the adaptation to climate change community to move beyond the design of hypothetical future adaptation strategies. In some regions, such as the Caribbean and the South Pacific, synergy such as this is already being achieved. However, urgent actions must be taken at the international, national and local levels if integrated climate risk management is to move from a concept to practice and serve to reduce risks and protect development.

At the international level, if it were recognised that most disaster risk is now climate related and that adaptation must refer to the management of existing climate related risks, the United Nations should promote an integrated international framework and partnership for risk management, which incorporates elements of and builds on existing frameworks for addressing climate change, disaster reduction, desertification and others. Such a framework needs to start from a clear concept that climate related risk is one of the central development issues of our time and the achievement of the UN Millennium Goals will not be possible unless climate related risks are significantly managed and reduced. The current proliferation of parallel international frameworks and programming mechanisms for addressing what is a holistic development issue is counterproductive if the objective is to strengthen national capacities to manage and reduce climate related risks.

At the national level, integrated climate risk management strategies, plans and programmes need to be built on the dispersed institutional and administrative mechanisms, projects, human and financial resources currently applied to disaster risk management as well as adaptation to climate change and other related areas such as desertification. The United Nations should develop new programming mechanisms and tools to promote integrated national climate risk management programmes as well as resource mobilization strategies to ensure that such programmes can be adequately funded.

Ultimately, integrated climate risk management needs to take root at the local level. Most climate related disaster events are small to medium scale and have spatially delimited local impacts. Ultimately, risk is manifested and losses occur at the local level and it is at this level that national and international support to integrated climate risk management has to be realised and capacities strengthened. At the same time, scaling up needs to occur given the diverse territorial base of risk causation.

Conclusion

Climate related risk, aggravated by processes of global economic and climatic change poses a central unresolved development issue for many countries, particularly but not exclusively for SIDS. Unless such risks can be managed and reduced the achievement of the UN Millennium Goals will be a mirage.

Current approaches towards managing disaster risk and adaptation to climate change fail to address the issue for different reasons. The first is still predominantly focused on response to disaster events and fails to address the configuration of hazards, vulnerabilities and risks. Moreover, mono hazard approaches still prevail in contexts more and more typified by concatenation, synergy and complexity and there is still a great deal to do in order to bring risk management and sustainable development concerns and practices together. The second focuses on the impact of future climate change on risk but fails to make the connection with currently existing climate related risk events and patterns. At the same time, both approaches are divorced both in concept and in terms of the institutional arrangements and programming mechanisms at the national and international levels.

If development is to be protected and advanced in countries affected by climate risks, an integrated approach to climate risk management needs to be promoted, building on successful approaches piloted by the disaster risk management community but mainstreamed in to national strategies and programmes. Addressing and managing climate risk as it is manifested in extreme events and impacts in the here and now is the most appropriate way of strengthening capacities to deal with changing climate in the future.

1.0 Risk Management and Adaptation to Climate Change

In 2000, the United Nations convened the Millennium Summit, where the heads of state of more than 100 countries agreed on the broad development goals for the next 15 years. The Millennium Development Goals define 8 major objectives that the world community should strive to attain by 2015. These goals have a direct relationship with improving overall human welfare, health, education and environmental sustainability, particularly in the world's poorest countries. As such, the Millennium Development Goals seek to reduce the vulnerability of the worlds poor by improving their income, education, health and environment.

Achievement of these goals is difficult, if not impossible, if integral human security and sustainability are not enhanced and guaranteed. Disaster risk levels and losses in society have shown such progressive growth over the last forty years that they now comprise a serious threat to sustainability and development. A very significant part of this loss is associated with hydro-meteorological events, and this is so both in developed and developing world contexts. Current trends and the constant introduction of new risk factors suggest ever-increasing losses in the future if deliberate, co-ordinated and conscientious action is not taken in the short and medium terms.

Disaster risk, or the probability of future loss and damage associated with the impact of external physical events, is socially constructed in contexts where hazards interact with exposed and vulnerable communities or societies. The very notion of hazard remits to the socially induced transformation of physical elements and resources into dangerous or potentially dangerous phenomena. This transformation is achieved when population, infrastructure and production are located in hazard prone areas and live or exist under vulnerable conditions. Vulnerability is a socially constructed condition implying lack of resilience and fortitude when faced with environmental extremes. This lack of resilience may be manifested at the structural, physical, economic, social and political and institutional levels.

Determined levels of risk associated with extreme physical phenomena are inherent to human existence on planet Earth. The history of human endeavour and societal advance is in many ways the history of adaptation to our physical environment. The positive utilisation of the natural resource base has always been accompanied by periodic loss associated with the natural flux of nature from benign to extreme conditions. Resources and hazards are in fact part of the same equation and continuum. Managing this continuum has guaranteed, during long periods of time, that the balance of gain and loss has essentially been positive.

However, during the last two hundred years in particular this "natural" equilibrium has been rapidly lost or eroded. The inherent risk associated with life on an unstable and still evolving planet has been compounded with what could be called "excess" or "surplus" risk. That is to say, potential loss associated with the creation or generation of new socially induced and spurious risk factors, whether on the hazard or vulnerability side of the equation. Many of these new factors derive from inadequate development practices, the inadequate location of human endeavour, the accelerating processes of environmental degradation, the introduction of potentially dangerous new technologies and the impacts and consequences of poverty and destitution.

Environmental insecurity and the threat of extreme disaster loss or damage increasingly add to the human insecurity associated with the disadvantaged social condition and position of billions of people, particularly in the developing world. The rapid increase in risk factors that followed the advent of the industrial revolution now promises to enter into a new progressive if not, abrupt phase. Global Climatic Change associated with the emission of green-house gases promises to introduce new risk factors that build on existing risks associated with normal climatic variability and extremes. The magnitude of these risk factors, their social and territorial distribution and impact, their temporality and overall consequences are as yet subject to speculation.

Global climate change is caused by an intricate chain of micro and macro processes, forcing us to distinguish truly global transformations in atmospheric, biosphere and human systems with what are pervasive world-wide environmental problems and hazards. Meshed with the problems of scale (what to include) are the problems of complexity (how to account for it), which pose formidable challenges for modelling, predicting and monitoring environmental change. Uncertainty is a dominant concern, but few now deny that the rate of advent of new climatic patterns and the hazards (and benefits) associated with these will be unprecedented in human history. Concatenation and synergy will increase the problems associated with hazards leading to new and as yet un-experienced types and levels of loss.

Managing risk will inevitably become a major societal concern going way beyond past and existing preoccupations associated with inherent and excess risk. Current trends and forecasts would suggest that the social distribution of risk and loss could become one of the dominating concerns of humanity in the future. Now is the time to begin to redress the current situation in which insufficient concern is paid to such matters and existing management and societal schemes are extremely unarticulated, dispersed and inefficient when faced with the magnitude and importance of the problem of risk and disaster. Short-term attention to existing and recurrent problems must be complimented with, and seen in the light of medium and long-term changes and impacts. Temporal, spatial and institutional integration must be promoted in order to take due account of the challenges associated with the management of societal risk in general, and disaster and climate change risk in particular.

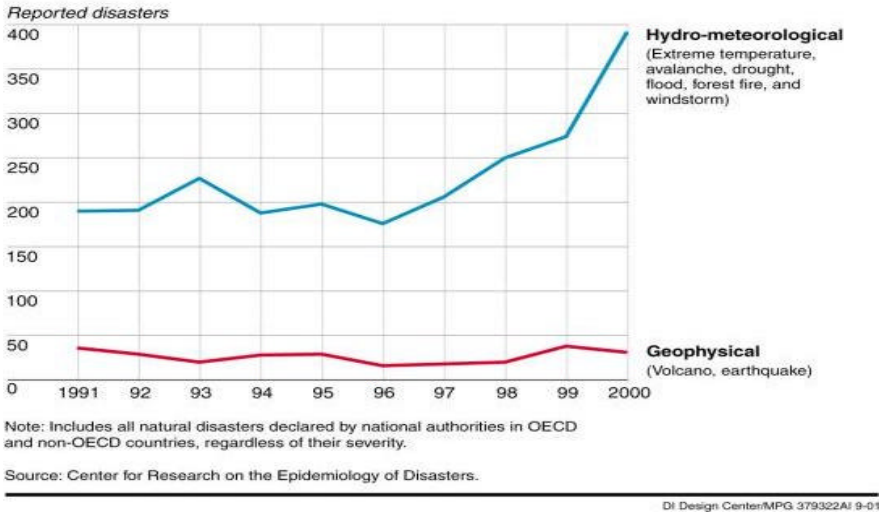
Risk and risk management must be placed squarely in the centre of the equation, and notions of disaster displaced from the still dominant concern and action in favour of preparedness and response in favour of proactive and prospective risk reduction and control. This must be achieved guaranteeing a close, synergic and interactive relationship between existing risk management, climate adaptation and sustainable development practitioners.

2.0 Climate Related Disaster Loss and Unsustainable Development

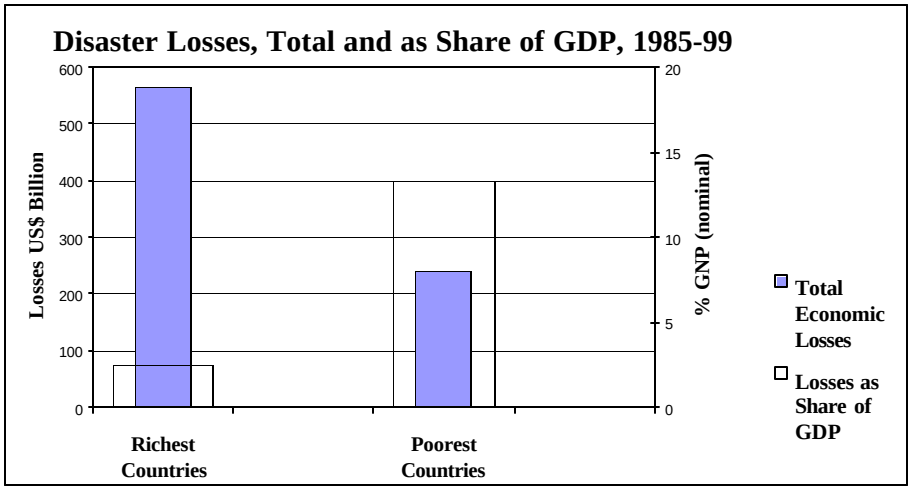
Although disasters are associated with a wide range of hazard types, hydro-meteorological phenomena account for a very significant part of disaster loss each year. Hurricanes, flooding, drought, hail storms and storm driven wave action account for over 70% of economic loss, again with a far higher relative incidence in the developing countries. By far the most damaging of natural hazards are floods, which account for 40% of all deaths in disaster events. It is estimated that half of humanity (3 billion) now lives in coastal areas or near rivers.

With regard to climate change, it is estimated that 14 of the 20 hottest years on record during the twentieth century occurred between 1980 and 2000, and the hottest year to date was 1998. This same year also broke records in the cost of destruction and disruption caused by disaster, with some US$98 Billion in damages and 32,000 casualties due to climatic phenomena, a 50% difference as compared to the previous year.

Overall, disaster occurrences and losses associated with extreme and increasingly not so extreme climatic events have increased dramatically in recent years and particularly since 1996. While the number of reported disasters associated with geophysical events such as volcanic eruptions and earthquakes remained remarkably constant, those associated with hydro-meteorological events such as floods, drought, forest fires and storms have demonstrated a curve of exponential growth. The number of reported hydro-meteorological disasters in 2001 was approximately double the figure reported in 1996. Hypothesis and speculation are inevitable with regard to the possible links between increased disaster loss, temperature rises and climate change.



Seen from the perspective of economic impact, in constant monetary terms, the losses during disasters throughout the world during the 1990s were *nine times* superior to those sustained during the 1960s and *six* times superior to those during the 1970s. This can be explained in terms of the increased exposure of population, infrastructure and production, increases in the value of assets and increases in human vulnerability to hazard events.



Although economic losses tend to be higher in absolute terms in the developed countries, the overall impact of disaster events is far higher in developing countries where over 90% of human losses occur in any one year. The small island developing states of the Pacific, Indian Ocean and Caribbean are particularly hard hit due to the very small size of their economies and the highly vulnerable nature of their economic base.

However, even developed countries have over the last decade suffered increased impacts from disasters, with enormous losses to national economies and the insurance and reinsurance business. Speculation now exists as to changing patterns of risk with greater threats to these countries in the future.

The levels of loss are now so great that some see the development process as a "loss factory" where gains are constantly drained off at the bottom. The burgeoning levels of loss are beginning to outweigh development gains in a number of countries and as such are fast becoming unsustainable. This is particularly the case in the small island developing states-SIDS. On the other side of the equation, it is now very clear that flawed development and environmental practices are at the root of much new disaster risk

3.0 Risk and Disaster. The Basic Causes.

Disasters actualise existing risk conditions. Hazards serve as detonators of pre-existing risk conditions revealing errors in the location of human activities and existing levels of social, economic and ecological vulnerability. Today, faced with the inevitability of many natural phenomena, the major bent in terms of explaining disasters and disaster loss favours the analysis of social vulnerability. Thus, although natural phenomena must be understood in terms of their physical attributes, magnitude and recurrence in order to provide information for risk managers and the population in general, it is human vulnerability, location and lack of resilience that are at the centre of the explanation of

many large-scale disasters. And, it is these factors that must be considered and modified in order to decrease disaster risk and incidence in the future.

Despite the dominance of large-scale or extreme natural phenomena as detonators of current day disasters, no disaster is in a scientific and real sense, "natural". Moreover, many hazards associated with increasing levels of loss are also not natural. Thus, whereas natural phenomena are transformed into hazards by human actions that expose population to their affects (they are socially constructed) and lead to social vulnerability, human intervention and action also creates new hazards.

Much has been written and is known as regards what are called technological, social or anthropogenic hazards. Conflagrations, explosions, oil spills, nuclear accidents and even terrorist activities are some of the many expressions of inadequately managed technology, human activity and social dissent. Natural hazards interfacing or interacting with technological or anthropogenic hazards many times lead to concatenation and synergy and new types, forms and extent of disaster loss.

Between the natural and anthropogenic hazards there exists a third major category of hazard type which as yet has received little attention, but which effectively establishes one point of convergence between the risk and disaster and the adaptation to climate problematic. Here we refer to what have been called socio or pseudo natural hazards. This notion refers to hazards that are created at the inter-face between human activity and natural or modified ecosystems. Examples may be found in the increased threat and potential for flooding, drought and landslides associated with river basin degradation and deforestation, the potential for coastal erosion associated with the wide-scale destruction of mangrove swamps and with urban flooding patterns that relate to the lack of adequate pluvial drainage systems in cities. Many other examples may be found including the threats for down stream populations and economic activity associated with large dams and reservoirs. This type of human intervention is also increasing the hazardous character of truly natural hazards and extending their impact to new areas.

Socio-natural hazards are ever on the increase and associated with much small and medium scale loss and damage that is rarely registered in the disaster loss data bases maintained by the international organizations. Increasing evidence exists to suggest that the accumulated impact of small and medium scale disasters is equivalent to or exceeds large-scale disaster impacts. These types of event are recurrent and their impacts are mostly felt at the local or community levels. With the scaling up of their multiple and diverse effects, the sum of many local impacts may be transformed into regional or even national impacts.

Whatever the types of hazards that help explain disasters, mainstream thought now places the risk and disaster problematic firmly in the development debate and concern. Sustainability of development in developing countries, in particular, is increasingly seen to be impossible without increased and sustained levels of security for humans and their endeavours and natural ecosystems.

Risk is seen as a product of differing processes of social and economic transformation that many times are euphemistically referred to as "development". Therefore, any major move in favour of risk reduction and control must be conceived within the framework of the development and project planning processes. Risk and disaster do not exist as

separate and autonomous conditions but are intimately related to ongoing social processes and must be dealt with in this context if any major advances are to be achieved. Skewed processes of social and territorial development are generating increasingly complex and intractable patterns of disaster risk, particularly in developing countries.

Although vulnerability, lack of social resilience and reduced levels of adaptation to environment are not defining characteristics of poverty per se, there can be no doubt that poverty is a major factor in explaining these, and their particular social and territorial distribution. Disaster risk is but one component of the risk faced by society. But, disaster risk is many times constructed on the basis of every-day or life-style risk typified by conditions of malnutrition, ill health, unemployment, lack of income, social and family violence, drug addiction and alcoholism, lack of education and opportunity etc. Dealing with existing disaster risk inevitably requires dealing with every-day risk. Social, community and human resilience in general are indispensable for reduction and control of disaster risk in the future. Reducing vulnerability means enhancing resilience and adaptation. Reduction of vulnerability requires development and increased resilience and sustainability can not be achieved without this.

4.0 Global Change, Complexity and Uncertainty

Processes of global change are adding new and even more intractable dimensions to the problems of risk accumulation and disaster occurrence and loss, associated with climatic events. Global change encompasses both socio-economic and environmental processes, and the links between them.

The globalization of local, national, sub-regional and regional economies over recent decades has increased the complexity of risk in spatial, temporal and semantic terms, continuously forging and reproducing new and as yet unpredictable patterns of risk at the social and territorial levels.

Due to global change rapid and turbulent changes in risk patterns in a given region are rarely autonomously generated and may, in numerous cases, be caused by economic decisions taken on the other side of the globe. This territorial complexity and concatenation of causal factors extends down to include the impacts of national sectorial and territorial development policies on regions and localities.

The impacts of globalization are being felt in both rural and urban areas. Urban areas often concentrate a complex interplay of multiple hazards and vulnerabilities with synergic effects and a very heterogeneous social and locational distribution. Rural areas in the developing world suffer diverse processes of incorporation and exclusion with differential impacts in terms of vulnerability and risk.

The accumulation of greenhouse gases in the atmosphere and resulting changes in the world's climate is a second global process that is increasing the complexity of risk. The scientific evidence that climate is changing due to greenhouse gas emissions is now incontestable. At the same time, it is equally well accepted that climate change will alter the severity, frequency and spatial distribution of climate related hazards. However, even while modelling of the linkages between global climate change and

particular climate events becomes increasingly sophisticated, it is still not possible to predict with any degree of confidence how particular climate events, in specific locations will behave in the future. Even with regular climatic variability associated with phenomenon like ENSO, important changes in types and areas of impact occur from event to event leading to imprecision in alert systems and preventive actions.

The notion of socio-natural hazards discussed above has generally been limited to the consideration of lower scale phenomena and local impacts. However, the notion establishes a natural bridge between current day disaster concerns and the problem of Global Climatic Change. The hazards now being experienced, or to be expected in the future with GCC are essentially socio-natural in origin, product of the relationship between human activities and the natural atmospheric system. Scale determinations and considerations may differ between the normal range of socio natural hazards and those associated with GCC, ranging from local to global, but the two types of concern have more in common than differences. Reversion or control of the hazard construction process is possible in both cases. And, despite the global nature of climate change, its impacts will in the end be felt locally or regionally, and interaction will occur with existing hazard patterns, the product of more localised socio natural processes.

Humans have been adapting to changing climatic conditions and to the impact of extreme climate events ever since their appearance on the planet. Much of this adaptation occurred gradually and spontaneously and the economies of many traditional societies to this day still depend on sophisticated production and social systems adapted to manage climate risk and variability. Much natural resource based development over centuries has depended on constant adaptation to changing environmental conditions.

The rapid accumulation of climate related risk in recent decades and the resulting patterns of loss, however, point to a loss of effectiveness and even breakdown in spontaneous adaptation and coping. As the range of hazards and vulnerabilities faced by any given community increases, it often becomes possible only to play one kind of risk off against another in search of a "less bad" scenario. Many highly vulnerable communities may deliberately choose to inhabit a hazard prone environment if this reduces other risks, related to income generation for example. Or, should they find themselves in hazard prone zones due to exclusion from formal land markets or for other reasons, they will many times opt to stay in order to maintain those conditions that provide them with the means to reduce daily life risk and vulnerability. On the other hand, factors such as poverty, limits to migration, land tenure systems, migration between ecologically distinct areas and a continuos reduction in terms of knowledge of ecosystems, inevitably place barriers to spontaneous adaptation

The processes of global change mentioned above have stacked the odds even higher against successful adaptation. As the causal processes of risk become increasingly global, the options available to local communities and other local stakeholders to influence risk generation processes becomes restricted, or non-existent. At the same time, the growing complexity of risk, due to both economic globalisation as well as to global climate change, greatly reduces the predictability and increases the uncertainty surrounding the occurrence of particular climate related disaster events: be they the rapid impact of floods, landslides, forest fires or hurricanes in given locations or the obsolescence of productive systems through changing climatic or market conditions.

In other words, the evidence from patterns of disaster occurrence and loss shows that climate related risks are rapidly increasing, which in turn indicates the growing failure of and breakdown of adaptation at all levels. The growing complexity and globalisation of climate related risk, translates at the national and local levels into impotence to affect the causal processes of risk and increasing uncertainty regarding the nature of risk itself and what could be viable strategies to manage and reduce it. Moreover, disaster risk becomes for the poor an unheeded notion when faced with more pervasive every day risk conditions associated with ill health, malnutrition, illiteracy, unemployment, drug addiction and family and social violence.

5.0 Risk Management- Differing Entrances, the Same Problem.

Faced with the bleak scenario of increasing disaster risk and loss, different approaches to manage and reduce climate related risks have been sought or attempted by the humanitarian or disaster response, development, environmental and climate change communities.

5.1 Disaster Response, Development and Environmental Institutional Approaches

Since the 1970's the national and international organizations responsible for responding to disaster events and for providing humanitarian assistance, have been gradually expanding their approach to address first hazards, then vulnerabilities, and eventually risks themselves. From their beginnings in response, many disaster related organizations have moved on to: strengthen capacities in preparedness and early warning (enabling the conjunctural mitigation of losses associated with extreme climate events); reduce hazard levels, through structural measures such as flood control embankments, soil conservation measures and others; reduce vulnerabilities through strengthening community and national level capacities and resilience and eventually to address integrated disaster risk management, in which a range of measures are designed to address the full range of hazards and vulnerabilities present in a given location.

However, despite the UN International Decade of Natural Disaster Reduction (IDNDR) in the 1990's, in which member states with the support of international organizations were supposed to make a concerted effort to reduce disaster risk, risks have continued to accumulate and increase, while most national and international efforts directed by humanitarian and response oriented institutions continue to be fundamentally preparedness and response focused. A large number of successful experiences, however, in Asia, Latin America, the Caribbean and Africa, in which different risk management approaches were piloted, have built up a substantial body of knowledge on the theory and practice of risk management. These successful pilot approaches provide a glimpse into the future of risk management, if they were to be mainstreamed and applied as part of a concerted and integrated programme.

For its part, the risk conscious development community has attempted to promote more integrated schemes where risk considerations are factored into development planning and projects. Despite the fundamental importance of such approaches, they are not as yet a common or regular practice. At the same time few deny the fact that it is with a

greater involvement of development based institutions that risk reduction can become more effective. Attempts to add risk reduction concerns on to existing traditional response oriented organisations faces enormous difficulties and limitations and a need exists to break out of traditional schemes and construct risk reduction endeavours on the basis of development oriented organisations and institutions.

Finally, the environmental community has increasingly seen the relevance of environmental management and good resource use for hazard control and reduction. This has been particularly apparent over the last five years and has been stimulated by the impacts of large-scale events during this period, which clearly revealed the relationship between environmental degradation and hazard occurrence. This is the case with large scale disasters in Central America, the Caribbean, Venezuela, Mozambique, China and Indonesia between 1998 and the present, particularly associated with flooding and landslides. The discussion on win-win and no regret policies now much in vogue are part of this packet. Equilibrium and resilience of ecosystems offers natural protection from natural hazards and reduces the likelihood of new hazards generated by processes of environmental degradation.

5.2 The Climate Change Adaptation Approach

Scientists and organizations examining the problem of global climate change have gradually expanded their approach from an initial concern with the causes of climate change, through a concern with modelling its potential effects, for example in terms of sea level rise and desertification, towards a concern with how societies and economies can adapt to changing climatic conditions.

Green house gas emissions and their potential effect on world climate has been the subject of research and debate for over 20 years. Major movements forward in the search to limit this phenomenon date primarily from the Earth Summit in Rio in 1992, with the signing of the UN Framework Convention on Climate Change (UNFCCC). In programme terms, this led to international efforts, through the UNFCCC, to mitigate climate change through international agreements to reduce green house gas emissions. The Kyoto Protocol in 1997 and the establishment of stipulated reduction levels over the next decade was the most important of these agreements and recent negotiations have centred essentially on the debate of common but differentiated responsibilities for climate change, and intractable discussions surrounding the Clean Development Mechanism.

On the other hand, the climate change arena – broadly speaking, the UNFCCC and the Intergovernmental Panel on Climate Change (IPCC) frameworks, and the array of research and advocacy entities that interact with these – has tended to identify increased human vulnerability to climate extremes as a likely outcome of climate change. As such, it has advised and undertaken research on vulnerability, produced an array of vulnerability assessments and to a lesser extent, advised and undertaken assessments of climate change adaptation.

Despite the search to limit the rate of climatic change and, in consequence, the hazards it will suppose for different regions and population groups, the inevitability of change has increasingly been recognised. Already accumulated emissions will guarantee this

change and this is now unavoidable. Reductions in emissions over the next years can not be achieved at a rate that is sufficient to greatly ameliorate change. In recognition of this fact, increasing attention has been given over the last five years in particular to the need to foment and support initiatives that promote or enhance the adaptation capacities of the population in affected regions and areas. By and large, however, actors in this arena have yet to make concrete and specific recommendations for *how* adaptation ought to be undertaken, nor to engage in actual responses to the specific instances of human vulnerability, although the issue of adaptation to the effects of climate change was first contemplated by the first conference of the parties (COP1) in 1995 in the following three stage process

Stage I: Inventory and planning, including studies on the possible impact of climate change, the identification of countries or regions particularly vulnerable and defining the policy options to guide adaptation measures and increase capacity building.

Stage II: Measures, which include continuing capacity building to lead the adaptation process in those countries most vulnerable to climate change, as defined in Article 4.1 (e) of the Framework Convention

Stage III: Measures to facilitate the adequate adaptation of other countries, including insurance and other measures contemplated in Articles 4.1 (b) and 4.4 of the Framework Convention.

In its last COP7 in Marrakech, the Climate Change Convention parties agreed on guidelines to orient adaptation strategies to climate change in those regions and countries most likely to be affected. This movement was consolidated with the results of the meeting where commitment to expanded funding for the development of adaptation strategies was agreed through the GEF and other financial sources.

Vulnerability and Climate Change

"Adaptations to current climate and climate-related risks (e.g., recurring droughts, storms, floods and other extremes) generally are consistent with adaptation to changing and changed climatic conditions. Adaptation measures are likely to be implemented only if they are consistent with or integrated with decisions or programs that address non-climatic stresses. Vulnerabilities associated with climate change are rarely experienced independently of non-climatic conditions."

IPCC Working Group II (2001) *Third Assessment Report*

With this gradual turn to adaptation considerations and an increase in its salience, the climate change adaptation community has clearly commenced to take up on a topic that is very close and complimentary to the traditional preoccupations of the risk and disaster community. How to live with and adapt to climatic extremes and how to promote more resilient and secure communities are questions that are in the centre of concerns for both communities.

However, in the same way as the risk and disaster community has failed in practice to substantially move beyond response to extreme disaster events, the climate change community has not yet been able to move beyond fairly theoretical formulations of vulnerability and adaptation, towards concrete plans and programmes of action. Such

notions as planned and spontaneous adaptation, and even the concepts of vulnerability and risk, are far more easily used and talked about than understood in practical and applied terms. The problems of uncertainty surrounding the modelling of the impact of climate change in particular locations, together with the difficulties of mobilising political will and support to adapt to uncertain future events are factors which conspire against the development and implementation of adaptation strategies.

5.3 The Challenge of Integrating the Concerns of Different Practitioner Communities

The clear coincidence that exists as regards a good part of the subject matter and concerns embodied in the climate risk management and adaptation to climate change problems has not as yet been reflected in wide scale collaboration, consensus and integration of the scientific and practitioner communities that espouse them. This is even truer when it comes to civil society and government in general where, in addition to misunderstandings as regards the problematic and the relationships that exist, consciousness levels as regards the seriousness of the problem and commitment to action are as yet ephemeral. Despite changes over the last decade, the disaster problematic is still essentially seen as being almost inevitable and the subject of preparedness and response planning. And, the global climatic change scenario is mostly seen as distant in the future, unspecified in terms of possible impacts and so unpredictable that planned action is not seen to be really feasible. Laissez-faire notions exist and short-term responses are still the predominant answer given.

Important discrepancies exist as regards fundamental notions and concepts and common misunderstandings exist as regards the approach and subject matter considered under these two non-discrete subject areas. Many of the differences in understanding, concept and approach probably derive from the different scientific origins of the two problems, the far more recent development of the climate change and adaptation problematic and a lack of communication between the different communities which is reflected in the lack of a common literature and the different institutional and organisational structures for the promotion of advances and change.

Despite this there can be little doubt that the two problems are essentially linked and represent a continuum where risk, human security and sustainable development are in the centre of analysis and concern.

Unlike the patterns of hazard occurrence and disaster incidence related to normal climatic variability where certainty, if not very high levels of certainty exist as to potentially affected areas and populations and patterns of hazard intensity over time, Global Climatic Change is plagued with the problem of uncertainty. When and how climate changes will impact on populations and ecosystems and the attendant risks are as yet very obscure. Modelling procedures as developed to date do not permit a sufficient degree of spatial and social accuracy. Moreover, how these changes will interact with current hazard patterns and risk scenarios is also unknown. The difficulties of projection and prediction can be appreciated when examining the tentative nature with which current science can predict impacts from a recurrent phenomenon such as El Nino. Evidence shows that different Ninos have different spatial and social impacts.

Uncertainty as to trends and patterns, concatenation and synergy, are paralleled however with the certainty that new macro and micro-scale hazards will be created with major impacts on population and environment. Given that climate is an integral part of the global environment, climate changes will not only affect socio-economic systems but also ecosystems, water resources and biodiversity, disrupting the natural resource base and threatening long-term sustainability. Traditional disaster related problems associated with hurricanes, flooding, drought, landslides and coastal erosion will be compounded with the impacts of climate change, with the risk of ever increasing damage and loss to society, particularly in the more vulnerable countries and population groups where resilience is lower and adaptation more difficult. This will be particularly apparent in rural areas where to date a still dominant portion of the world's poor population lives, and natural resources are the basis of sustenance and livelihoods. However, this will also be a severe problem for the urban poor and other population groups. This is particularly true in the short and medium term in Latin America where today over 75% of the population is urban and the trend is ever upwards.

Any possible long term benefits of climate change notwithstanding, dis-synchronization of climatic and terrestrial systems will likely involve numerous incidences of loss, both large and small, including disasters, impoverishment stemming from losses of assets and opportunities of the poor, disease outbreaks, water resource shortages, loss of viability of particular agricultural systems and ecosystem decline.

In effect, the potential changes associated with global climatic change and the new patterns of risk and disaster that will develop, constitute a "natural" follow on to and outcome of the current risk and disaster problematic. Risk is constantly evolving as new or modified risk factors are introduced by societal action. Historically, the risk scenario has been moulded and modified with all major societal advances, changes and innovations. The industrial revolution led to the introduction of technological hazards and rapid changes in land use and environmental practices that have had severe consequences as regards the generation of risk. The advent of nuclear energy added new risk factors. And, the present trend with Global Climatic Change, incited by human intervention in the environment, comprehends a further step in the constant evolution of risk in society, with the added problem of the rapid speed of change, the probable magnitude of the possible effects and the new challenges this signifies in terms of human adaptation.

As regards the different understandings that exist as to practice, there is a tendency for external viewers to see disaster and risk management practice as being dominated by preparedness and response concerns when faced with current and repetitive problems. And, to see practice as being directed essentially to already existing and more or less predictable risk contexts related to normal climatic variability. Moreover, risk management specialists and practice has done very little to date to incorporate climate change variables and contexts in their action frameworks. These still show a tendency in favour of short-term actions and solutions based on historical patterns of hazard incidence. This is compounded by the still dominant approach oriented in favour of single hazard approaches as opposed to the use of multi hazard analysis and action frameworks.

Despite this general context, reality shows that the risk and disaster management communities are not monolithic blocks. Efforts and movement that attempt to change

the status quo, promoting more integral visions as regards risk management, and pushing practice more in favour of risk reduction and risk control areas (as opposed to traditional and dominant response concerns) have been prevalent over the last decade. Nowadays, risk management tends to be progressively seen as a cross cutting, integrative and cross sectorial practice covering concerns that go from disaster prevention and mitigation through response to reconstruction. Decentralization and community and local participation are seen as essential components of this practice. Moreover, the dominant tendency to see disaster prevention and mitigation as something that attempts to reduce existing risk levels in society and thus "prevent disasters" has been gradually eroded giving way to a vision that also incorporates prospective considerations. Corrective or compensatory risk reduction operating on existing levels of risk has been complimented with a move in favour of prospective risk management that attempts to foresee and control future risk. This can be seen with the insistence that risk management should be an integral component of development and project planning cycles. New developments must be analysed and considered in the light of potential new risk factors.

For its part, the Adaptation to Climate Change community is also not a monolithic block as regards thought and practice, despite the relatively youthful nature of these concerns. This community may have commenced development of ideas thinking in terms of adaptation under conditions of uncertainty and in long time periods using the complimentary notions of "spontaneous" and "planned" or "independent" or "formally planned" adaptation to climate change. And, this may have been done basically ignoring present hazard scenarios associated with normal climatic variability. However, today, this is not always the case, and some current thought favours more incremental approaches, building on current patterns of risk, introducing incentives to increased resilience and adaptation under current conditions as a basis for longer term adaptation.

The notions of no regret and win-win policies and practice reflect this current train of thought. That is to say, many adaptation strategies are consistent with sound environmental practice and wise resource use today, and are appropriate responses to natural hazards and climate variability and to the threat of creation of new socio-natural hazards. No regret adaptation strategies are seen to be beneficial and cost-effective even in the absence of climate change. Win-win strategies have their rationale in ecosystem maintenance, improved resilience and enhanced livelihoods. Finally, current thought also tends to support the idea that long-term planned adaptation will not really be feasible in many instances, although government incentives and support for adaptation must exist. Spontaneous or independent adaptation is already happening in many hundreds of diffuse, incremental actions by many stakeholders.

In sum, it is clear that despite the still de-linked nature of the two scientific and practitioner communities the points of convergence between them far outweigh the differences in emphasis and approach. A common problem related to risk in society and uncertainty as to future impacts and the social and territorial distribution of these, a concern for the relations between society and environment, and a flux between short and long term considerations typifies both. Moreover, it is also very clear that the basic point of departure for both communities is the notion of sustainable development and livelihoods.

Despite the similarities in the climate risk management and adaptation problematic, the evidence shows that present national and international efforts to design strategies to adapt societies and their economies to the effects of climate change and national and international efforts to manage the disaster risks associated with extreme climate events remain fundamentally divorced. In many, if not most, developing countries totally separate and parallel institutional systems and programming mechanisms exist for promoting adaptation to climate change on the one hand and disaster risk management on the other hand. On another related front, it is only recently that a search for synergy between objectives and institutional frameworks has been sought with regard to the UN Environmental Conventions on wetlands, biodiversity, global climatic change and desertification. These are all clearly related one to the other but have been dealt with until recently as if they were separate and discrete problems.

Retrospective analysis will show that an important problem during the International Decade for Natural Disaster Reduction was that insufficient gains were made in integrating diverse specialist groups and caucuses all with a clear importance for risk reduction and related to sectoral and territorial development, environmental management, poverty reduction etc. The tendency was still for these groups to work apart and not as an articulated whole. We are now faced with a similar problem on the expanded basis given by current concerns for climate change adaptation.

This divorce between the adaptation to global climate change and the disaster risk management communities is unproductive and even absurd if it is accepted that both are addressing the same issue of climate related risks, but from apparently different viewpoints. This includes supposed differences related to the time period under consideration. Risk managers are seen to deal with current and short term risk and climate adaptation specialists with longer-term changes and risk. But this is essentially a false separation. Risk, by definition, refers to the probability of certain events occurring in the future. The uncertainty surrounding the specific impacts of future climate change in particular space-time coordinates is therefore an intrinsic characteristic of existing risk and which has to be dealt with by risk management in the here and now.

The lack of capacity to manage and adapt to climate related risks is already a central development issue in many developing countries, particularly in SIDS. From this perspective the lack of capacity to manage the risks associated with current climate variability and with already occurring extreme climate events is the same lack of capacity that will inhibit countries from addressing the future increases in the complexity and uncertainty of risk due to global climate change. In the sense that the entire potential of the future already exists like a seed in the present moment, strengthening national and local capacities to manage climate related risks, as they can currently be assessed, is the best strategy to be able manage more complex climate risk in the future. At the same time, it is more feasible to mobilise national and international political and financial resources to manage an existing risk scenario than to address a hypothetical future scenario. Medium and long-term adaptation must begin today with efforts to improve current risk management and adaptation initiatives and contexts. And, lessons from current practices along with the notion that learning comes from doing are of critical importance.

Despite the prevalent divergence between the two communities, some convergence can now be witnessed, however, in various areas where risk management and climate change adaptation communities have come together, and these with the development community. This is the case in the Caribbean, Central American and South Pacific areas for example where attempts at methodological and strategy integration are occurring. However, this is still not the case in general and a relatively deep divide still exists in conceptual, methodological and practical terms. This must be overcome and integration achieved in the interest of promoting more coherent and efficient approaches. Each community has much to learn from the others as regards concepts, methods, strategies and instruments of common use in the promotion of short, medium and long-term risk reduction, control and management in general.

There is an urgent need, therefore, to build on the successful approaches piloted by the disaster risk management community over recent decades, while using increasingly accurate modelling of the impact of global climate change in specific locations, to develop integrated or total climate risk management plans and programmes.

6.0 Integrated Climate Risk Management

Whether dealing with actual potential disaster contexts, or future impacts associated with climate variability and change, the essential challenge is risk reduction, risk control, the increase in human resilience and increased capacities to adapt continually and prospectively to possible environmental extremes and conditions. In view of this, it is imperative that we develop an **integrated risk management focus** that brings together current risk and disaster and adaptation to climate change concerns and communities, relating these closely to sectoral and territorial sustainable development caucuses and agencies. This synthesis should be articulated and operationalized into one of total risk management for a wide range of elements at risk, ranging from communities to ecosystems, at long and short time scales and across spatial scales.

Integrated climate risk management, as a concept, would address both the hazards and vulnerabilities which configure particular risk scenarios and would range in scale from actions to manage the local manifestations of global climate risk, through to global measures to reduce hazard (for example, by reducing greenhouse gas emissions) and to reduce vulnerability (by increasing the social and economic resilience of vulnerable countries such as SIDS, for example). Integrated climate risk management would need to include elements of anticipatory risk management (ensuring that future development reduces rather than increases risk), compensatory risk management (actions to mitigate the losses associated with existing risk) and reactive risk management (ensuring that risk is not reconstructed after disaster events). Moreover, it will have to take into account both potential impacts on socio-economic and environmental systems.

Integrated climate risk management could provide a framework to allow the disaster community to move beyond the still dominant focus on preparedness and response and for the adaptation to climate change community to move beyond the design of hypothetical future adaptation strategies. In some regions, such as the Caribbean and the South Pacific, synergy such as this is already being achieved. However, urgent actions must be taken at the international, national and local levels if integrated climate

risk management is to move from a concept to practice and serve to reduce risks and protect development.

At the international level, if it were recognised that most disaster risk is now climate related and that adaptation must refer to the management of existing climate related risks, the United Nations should promote an integrated international framework and partnership for risk management, which incorporates elements of and builds on existing frameworks for addressing climate change, disaster reduction, desertification and others. Such a framework needs to start from a clear concept that climate related risk is one of the central development issues of our time and that, as stated in the first part of this summary, the achievement of the UN Millennium Goals will not be possible unless climate related risks are significantly managed and reduced. The current proliferation of parallel international frameworks and programming mechanisms for addressing what is a holistic development issues is counterproductive if the objective is to strengthen national capacities to manage and reduce climate related risks.

At the national level, integrated climate risk management strategies, plans and programmes need to be built on the dispersed institutional and administrative mechanisms, projects, human and financial resources currently applied to disaster risk management as well as adaptation to climate change and other related areas such as desertification. The United Nations should develop new programming mechanisms and tools to promote integrated national climate risk management programmes as well as resource mobilization strategies to ensure that such programmes can be adequately funded.

Ultimately, integrated climate risk management needs to take root at the local level. Most climate related disaster events are small to medium scale and have spatially delimited local impacts. Even large-scale events can really be interpreted as the sum of a large number of local impacts. Ultimately, risk is manifested and losses occur at the local level and it is at this level that national and international support to integrated climate risk management has to be realised and capacities strengthened. Differential levels of loss at the local levels when faced with similar hazard conditions can only be explained by the differential levels of vulnerability that exist.

7.0 Some Parameters and Indicators for Integrated Climate Risk Management.

The raising of consciousness among critical political decision makers and the public in general as regards the needs and challenges associated with integrated risk management may be achieved concentrating first on the present disaster problematic and more adequately dimensioning its real impacts on development, and then linking in climate change considerations. Short term, existing problems are probably more convincing elements for decision makers than long term uncertainty. On the other hand, seeking to manage impacts associated with such phenomenon as El Nino and other sources of inter-annual time-scale climatic variability gets political actors, sectoral experts and the public involved in managing climatic risks. Therefore, learning to prevent negative impacts from such phenomena presents a strategic opportunity for building resilience to climate change and for increasing social consciousness as regards the need for increased attention to future possible climate impacts.

Applications of an integrated risk management framework in decision making should take into consideration that

- The current development situation and needs in a particular location is the most appropriate starting point for additional risk reduction and control efforts of an adaptive nature.
- Adaptation strategies currently being pursued in local, regional and national settings are often extensions of on-going efforts to reduce climate related disaster risks.
- While past climate is not a good guide as to the future climate, past experiences and lessons learned from efforts to improve management of climate variability are valuable for adapting to climate change. In addition, spatial and temporal trends in past disaster events reveal current vulnerabilities and risks.
- Adaptive learning comes from doing, and lessons must be learnt from successful and best practices already implemented. It is highly unlikely that adaptation will come from a priori planning.
- Adaptation will require continual adjustment of risk management practices to account for changing climate hazard and vulnerability conditions.

People will out of their resourcefulness, or out of necessity, adapt to climate change. This constitutes independent or autonomous adaptation. This contrasts with formally planned adaptation that involves deliberate policy decisions, plans and implementation by external parties. In many cases, independent adaptations will be adequate, satisfactory and effective. However, under some circumstances independent adaptation may not be satisfactory or successful due to erroneous or limited understanding of climate change, limited knowledge of possible adaptation options, the negative impact of group adaptation on others, the ignoring of the needs of future generations, cultural constraints to adaptation, lack of resources, or the greater cost effectiveness and efficiency of collective responses, as opposed to individual or community schemes. In such cases, the role of external agents should be to facilitate the adaptation process in order to ensure that the stated obstacles, barriers and inefficiencies are addressed in an appropriate manner. This will require provision of reliable information, financial, technical, legal and other assistance, and the direct implementation of adaptation options where the scale of response is most appropriately at the national level, provisions to guarantee that adaptation options do not have adverse environmental, social, economic or cultural effects and the ensuring of equity in the adaptation process.

Information and access to reliable data will be a critical factor in adequate decision making from the government through the community levels, and in the reduction of uncertainty associated with medium and long-term climate change. In addition to the generation of more temporally and spatially specific information, more will need to be done to translate climate information into decision support tools for sector and region specific applications. Information on both climate variability and long-term trends needs to be translated into risk information for decision making. Reduction of uncertainty will be facilitated through the exchange of information up and down spatial and social scales, from scientists to policy makers and between specialists. But, uncertainty about risks and impacts of disasters and climate change needs to be explicitly recognised in the decision making process for all development decisions. This could be achieved by

creating "headroom" for environmental considerations in all development planning decisions.

Uncertainty is a major factor as regards future changes. New information will in many cases change the nature and appropriateness of decisions that have been made. Flexible institutional arrangements should be promoted that have the capacity to incorporate new information on environmental risk into development planning, as it becomes available. Flexibility within the institutions to adapt to the new information is necessary to avoid inappropriate path dependency and mal-adaptation.

The integrated climate risk management approach should draw on frameworks that have been developed to date for disaster risk identification, reduction and transfer, as well as others developed in such contexts as farming systems research and commodity, food security and financial risk management. And, in order to assess and address risks across a wide spectrum, and develop improved management decisions relating to short and long-term risks, there is a need for cross cutting coherence in such areas as assessment methodologies, assessment studies, recommendations based on sound analysis and risk/related terms and concepts. A more coherent approach to risk assessment and reduction will assist in identifying risk management alternatives in both the structural and non-structural domains such that both the short term objectives of disaster risk reduction and the longer term objectives of adaptation to climate change will be more fully achieved.

Any approach to risk management and adaptation should be essentially prospective or anticipatory, and promoted in the very short term. This will

- Widen the range of possible response options, decrease costs in the medium and long terms, limit the possible levels of social disruption and prove to be more environmentally sustainable than with reactive approaches.
- Gain immediate advantages through the promotion of *win-win* and *no regret* policies that build on current conditions, strengthening ecosystems and providing immediate and future benefits as regards social protection for vulnerable communities, sectors and critical systems.
- Provide increased levels of protection for many development plans and projects now under consideration, which are likely to be subject to impacts by future climate change and sea level rises.
- Provide for the immediate enhancement of institutional capacity, developing expertise and building knowledge. These are factors of critical importance for adaptation and take time to develop.

On the other hand, the complexity of risk generating processes, the range of socio-economic and environmental considerations that come into play and the diverse and complex nature of the social intervention required, requires the search for coherence and coordination across

- Geographical scales--community, local, regional, national and global.

- Time scales-- seasonal, inter-annual, decadal and centennial.

- Climate affected sectors-- water resources, health, agriculture, food security, ecosystems etc.

- Development concerns—poverty reduction, coastal zone management, rural development, urbanisation, economic growth etc.

- Stakeholder groups—scientists, experts, politicians, nation states, non-governmental organisations, regional and international organisations, financial institutions and civil society in general.

The primordial emphasis in risk reduction, risk control and adaptation schemes should be on increases in the resilience of the poor in particular, favouring the most vulnerable. To date there has been an over emphasis on adaptation and mitigation and insufficient attention paid to resilience, livelihood strengthening and risk management in general.

The integration of the risk and disaster, and adaptation approaches in a single risk management approach must be supported with a strengthening of the ongoing process favouring synergies between existing UN Environmental conventions relating to global climatic change, biodiversity, wetlands and drought. The complexity of risk contexts demands increased integration, harmonisation and cooperation between until now separate concerns, caucuses and interest groups. This will also require institutional reform and reorganisation permitting more flexible and agile relationships between complimentary areas of concern. The modification of inter-governmental frameworks and policies will be required in order to dissolve barriers separating the issues of climate change adaptation, disaster risk management and sustainable development. And, concrete actions must be taken to support local, national, and regional efforts to manage climate-related risks, beginning in the present and building on current initiatives.

A starting point for more committed and integrated action relates to the UN System as such where even greater efforts must be made to assure that risk considerations are incorporated in existing planning and programming mechanisms such as the CCA and UNDAF. The UN should serve as a promoter, advocate, and stimulation to innovative behaviour and change.

8.0 By way of conclusion

To conclude, climate related risk, aggravated by processes of global economic and climatic change poses a central unresolved development issues for many countries, particularly but not exclusively for SIDS. Unless such risks can be managed and reduced the achievement of the UN Millennium Goals will be a mirage.

Current approaches towards managing disaster risk and adaptation to climate change fail for different reasons to address the issue. The first is still predominantly focused on response to disaster events and fails to address the configuration of hazards, vulnerabilities and risks. Moreover, mono hazard approaches still prevail in contexts more and more typified by concatenation, synergy and complexity and there is still a great deal to do in order to bring risk management and sustainable development concerns and practices together. The second focuses on the impact of future climate change on risk but fails to make the connection with currently existing climate related

risk events and patterns. At the same time, both approaches are divorced both in concept and in terms of the institutional arrangements and programming mechanisms at the national and international levels.

If development is to be protected and advanced in countries affected by climate risks, an integrated approach to climate risk management needs to be promoted, building on successful approaches piloted by the disaster risk management community but mainstreamed into national strategies and programmes. Addressing and managing climate risk as it is manifested in extreme events and impacts in the here and now is the most appropriate way of strengthening capacities to deal with changing climate in the future.