Thematic Discussion Paper Cluster 4.

"REDUCING THE UNDERLYING RISK FACTORS"

Discussion papers have been prepared for the five thematic clusters of the WCDR. The papers have been developed by the Lead Agencies for each cluster with the support of the Inter-Agency Task Force for Disaster Reduction (IATF) and the ISDR secretariat.

The objective of these papers is to orient and guide the discussions in the five clusters toward the goals of the Conference. The papers provide a vehicle for coordinating the interests of the key stakeholders and will form the basis for the subsequent summarising of the thematic clusters.

Session organizers and participants in the thematic discussion are invited to draw on the papers to ensure the output of the sessions and panels at Hyogo-Kobe provide the technical assessment and guidance to complement and support the priorities identified at the intergovernmental level and to advance the International Strategy for Disaster Reduction (ISDR).

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1. Introduction

1.1   Purpose of the paper

The purpose of this discussion paper is to provide a basis for the proceedings and debates of WCDR's thematic cluster 4, "Reducing the Underlying Risk Factors". It will highlight the pertinent issues to be discussed under the theme, and contribute to the outcomes of the conference.

1.2   Nature of themes being addressed

There are a number of causal factors of disaster risk, arising from and associated with urban and rural development. These include land management, integrated resources management, industrial and economic development, health risks, and building and construction aspects. Social issues relevant at the community level, as well as gender issues, also play a role in understanding and reducing risk.

The heightened levels of disaster risk that humankind currently faces is a result of a number of causes, including exploitation of natural resources and alteration of the natural environment. This is compounded by a lack of understanding of the forces and processes that cause these risks.

While the human dimensions of disasters and the risks that they pose has received much attention, there is also a need to take a closer look at the environmental aspects of disasters, both as a source of disasters (deforestation, natural resource exploitation etc.), as well as a casualty of the disaster (destruction of coral reefs and fishing ponds from floating debris, proper disposal of waste from disasters). This raises the criticality of managing and maintaining environmental systems in good shape in order to avoid and reduce the impacts of disasters, and in the deterioration of living conditions.

A number of key factors that compound the risk can be identified: (a) development processes and the risk that they pose – for example, natural resource exploitation, urban development, environmental degradation, caused by a number of factors, such as soil erosion and deforestation; (b) structures exposed to disaster risk – for example, public infrastructure, residential housing, critical facilities such as hospitals, heritage assets; (c) institutional and financial framework and social setting – for example, building codes, financing and insurance for disaster mitigation, community actions for prevention, poverty and livelihood etc. and (d) mechanisms to deal with risk, within the larger perspective of sustainable development.

While some natural hazards such as earthquakes and volcanoes are not triggered by human action, hazards such as flooding, landslides and wildfires can be and landslides are worsened by human activities. Hence, impacts of disasters are exacerbated not only due to the intrinsic hazards of the situation or location, but also because populations are vulnerable to the effects of the hazard. Risk management practices should pay attention to both the hazard itself, and the populations vulnerable to these hazards.

1.3 Linkages with other themes

The discussions for the WCDR is clustered around five themes, namely, (1) Governance: institutional and policy frameworks for risk reduction, (2) Risk identification, assessment, monitoring and early warning, (3) Knowledge management and education: building a culture of resilient communities, (4) Reducing the underlying risk factors, and (5) Preparedness for effective response.

Reducing the risk associated with disasters (Cluster 4) cannot be dealt with in isolation – assessment of risk factors is a key prerequisite in planning and implementing measures to mitigate their impact. Recognizing, understanding and assessing the causal factors of risk are critical first steps towards overall disaster reduction (Cluster 2). Awareness raising and education on risk reduction (Cluster 3) starts at the community level, and dissemination of risk assessments is a critical ingredient in planning effective action. Implementation of disaster mitigation techniques in an effective and sustainable manner (Cluster 3) is a major factor in reducing risk. A related set of governance issues is that of transparency and accountability, accessibility and efficiency, within a structured organizational and operational set up, that enables rapid and comprehensive response to a disaster (Cluster 1). While not all disasters are preventable, disaster response can also be expensive, diverting scarce resources to relief and rehabilitation. Reducing the disaster risk factors and raising the public awareness help in planning and preparing for a disaster (Cluster 5) with comprehensive disaster risk reduction strategies.

Of particular relevance to this WCDR Cluster is the role of different stakeholder groups in reducing vulnerabilities and risks. While risks managed by national and local governments are well understood and mapped out, that of communities and businesses are not usually taken into account.

Given that the central factor in underlying risk is probably the presence of humans and their assets in hazardous areas, localized community-based disaster management is a critical aspect of risk reduction. Risk reduction measures are therefore most successful when they involve the direct participation of the communities most likely to be exposed to hazards. There is adequate experience to show that the involvement of local residents in protecting their own resources can work – if sufficient attention and investment are devoted to the subjects. Disaster reduction is most effective at the community level where specific local needs can be met .

Businesses are exposed to great risks resulting from disaster incidents, and also have enormous potential to assist in disaster management. However, little attention has been paid to the key role that the private sector can play in reducing the risk of disasters, and/or the risks associated with disasters – whether natural or man-made – and how coordination with government programmes may be improved.

1.4 Conference context

There is a clear need to understand and take action on the risk factors that lead to disasters – in making it an integral part of the overall development, and in creating disaster preparedness and management plans. Reducing risk factors with appropriate strategies and mechanisms is a

critical emphasis being placed by the WCDR. Clearly, this requires an increase in the importance placed on disaster risk reduction methodologies and techniques, at the local as well as global levels. Much can be achieved in reducing risks by the promotion and integration of disaster risk reduction in sustainable development planning and practice – for example, in project appraisals, environmental impact assessments, and implementation plans. This also calls for building and strengthening the local and national capacities to address the causes of disaster risks.

There is a need to place stronger emphasis on action to reduce risks and hazards and overcome the shortcomings of current practices, particularly at the local level, where the impact of a disaster is most acutely felt. Some of these shortcomings include, the tendency of local governments to favour short-term gains in urban development over long-term security; the widespread weakness of enforcement of existing safety regulations; the massive stock of vulnerable existing buildings and housing; and the under-equipping and poor training of local rescue services.

The discussions in the Clusters and WCDR's proceedings will have to consider several key questions such as how people can avoid making natural risk worse, how to avoid exacerbating risk through bad spatial and urban planning, and how to be better informed to cope with hazardous situations to reduce the risks and their impacts.

The WCDR's proceedings and processes will also have to be contextualized from the perspective of the larger international development agenda, particularly the World Summit on Sustainable Development, and the Millennium Development Goals. These declarations, agendas and conventions have covered, among other things, the environment, freshwater management, climate change, desertification, social development, gender, health, habitat, and food security. All contain commitments related to disaster reduction. For example, the political statement adopted at WSSD acknowledges that the challenge lies in recognizing the severe threat that disasters pose to sustainable development, and requires immediate attention at the global, regional and local levels.

2.0 Findings of the Yokohama review

2.1   Key sections of the Review

The Yokohama Review placed clear emphasis on managing risks through multi-sectoral and specific areas of interest, specifically focusing on environmental and natural resources management; social and economic development, poverty alleviation, financial instruments or mechanisms, traditional knowledge and experience, technical programmes of infrastructure protection and physical measures, land use and planning practices, advanced technologies etc.

Of particular relevance to Cluster 4 are issues related to community involvement, technical and administrative services, land use planning, technologies, education, training, capacity building, finance, regulations etc. Recent research has highlighted the following:

- Mainstreaming disaster reduction in education, public health, water, agriculture, forestry, environment and physical planning among others;

- Improving disaster management through a more coordinated approach within government, and by also involving other stakeholder groups;
- Developing disaster impact assessment and environmental vulnerability indices as decision-making tools
- Enhancing synergistic relationships among disaster risk management and community-based organizations;
- Ensuring that social and economic development in education, health and social welfare address disaster risk reduction;
- Fostering community-based lending schemes, insurance packages, and micro-investment programmes;
- Financing disaster risk reduction measures and cultivating institutional commitment at the macro-economic level;
- Assisting governments and insurance companies in translating viable risk transfer mechanisms to the uninsured or poorly insured population;
- Land use planning as an essential tool in disaster reduction;
- Ensuring the participation of the widest range of stakeholders in sustainable regulatory practices;
- Mapping areas of extreme risk, strengthening existing buildings, protecting infrastructures, setting standards of construction through building codes and enforcing compliance to set standards;
- Using and maximizing use of advanced technologies for disaster reduction, particularly related to forecasting, monitoring and modeling, retrofitting buildings, etc.;
- Placing relevant data and information in the hands of local communities for implementing land management practices and conveying effective early warning messages; and
- Strengthening the regional and international cooperation with the view to building capacities on sustainable use of space and telecommunications-based applications for disaster reduction.

2.2 Conclusions from the Review

The Yokohama principles used a policy framework consisting of five thematic areas, a guiding analysis and evaluation, and a future action agenda.

In the last ten years, observations from the activities that are of critical importance to understanding and reducing risks, show that:
- Disaster risk reduction is now increasingly being approached from multi-sectoral and multi-stakeholder perspectives, but further effort is needed to involve influential stakeholder groups such as the business sector and at local level, community groups in hazard areas.
- Existing practices and techniques in natural resource management have an implication on disaster risk reduction – for example, environmental impact assessments.
- Mechanisms to address disaster risk reduction through social and economic development, particularly at the community level, are being widely applied.
- Emphasis is being placed on community participation in planning and implementation of programmes that promote social and economic security, aiming at risk reduction, but more attention needs to be placed on this issue particularly at the national level.
- A growing institutional commitment and investment in disaster risk reduction at macro levels – sub-national, national and regional – is being observed, including the

mainstreaming of disaster reduction into development strategies through multilateral financial institutions.

- Insurance and financial sectors have been active in supporting risk reduction measure through public awareness, incentives and risk mitigation/preparedness.
- Effective risk reduction measures have been developed in the health sector to reduce mortality, morbidity and disability related to disasters. Inclusion of risk reduction strategies in health sector policies and planning have, as a result, helped reduce risks to health in disasters, and overall health equity. Key in this process is the activation of partnerships at all levels, vertically and horizontally.
- Urban and land use planning methodologies have evolved to include risk assessment, environmental management, socio-economic development. If applied more widely, they could indeed assist in reducing and mitigating the risks of disasters.
- Building codes and other disaster resistant construction measures are now well established by the professions and are often also applied in regulation, but in many countries such codes are not applied or enforced on a scale sufficient to prevent human disasters during violent natural events, due to their complexity or difficulty in implementation.
- There has been recognition of the role of ICTs and related technologies in disaster risk management. The advancement of technologies like GIS, space observation and other communication technologies have gradually made their use less expensive, more versatile and easily accessible. The sharing of resources in applying such technologies for environmental and disaster risk reduction purposes have also made their use more effective.

2.3 Examples of effective practices

There are a number of examples in organizations and institutions taking effective action to reduce the risks associated with disasters, and several of these are embedded in the Yokohama Review, . Some other interesting examples include:
- The Andean Development Corporation has embraced a multi-sectoral approach to vulnerability reduction, which is coordinated among various ministries across the participating countries;
- A good example of integrating environmental management with disaster risk management comes from the Pacific island states where the 'Environmental Vulnerability Index' is being developed, aiming to better inform decision makers;
- A better use of natural resource management towards disaster reduction has been demonstrated by the National Red Cross Society in Vietnam, and some NGOs in Bangladesh, by pursuing the RAMSAR convention which calls for the retention and restoration of wetlands;
- Community-based initiatives with cross-sectoral support have been pursued by various international and national organizations in developing countries. Examples of this include the Pan-American Health Organization (PAHO) working for protection of health facilities; National Society for Earthquake Technology (NSET) campaigning for school safety in Nepal; and the Department of Social Welfare and Development along with other national institutions in Philippines pursuing community capacity building initiatives;
- The Grameen Bank in Bangladesh has been successful in micro-investment programs with social and economical incentives, and the Gujarat State Government in India is

putting its effort to transfer basic elements of social security and economic transfer of risk in rehabilitation programmes after the Gujarat Earthquake;

- Following the floods and landslides that occurred in Venezuela between November 1999 and February 2000, UNEP made a preliminary environmental damage assessment, on the basis of which the government of Venezuela developed a project for strengthening environmental vulnerability and risk assessment. This included an inventory of damage caused by the floods and landslides, and detailed vulnerability and risk assessment maps for the EI Avila region.

- Multi-lateral financial institutions such as the World Bank, through its Hazard Management Unit, has begun to incorporate commitment for disaster reduction as a condition to lending capital for rehabilitation after disaster. Similarly, the Inter-American Development Bank has made disaster reduction a core element of its lending strategy for development, after studying the impacts of Hurricane Mitch in Central American countries in 2000. The Asian Development Bank has also revised its lending policies recently to promote disaster reduction in development. The African Development Bank is currently formulating guidelines with the help of specialized agencies aiming to mainstream disaster reduction into development strategies in its member countries;

- Strong participation of stakeholders in disaster risk reduction efforts can bee seen in Risk Assessment Tools for Diagnosis of Urban Areas against Seismic Disaster (RADIUS), implemented by the Secretariat for International Decade for Natural Disasters (IDNDR). Similar efforts have been made by World Seismic Safety Initiative (WSSI), Earthquake Mega-Cities Initiatives (EMI) and Geo Hazards International. Asian Disaster Preparedness Centre (ADPC) and United Nations Centre for Regional Development (UNCRD) are carrying out community based disaster reduction activities where technical and social aspects of disaster reduction are well integrated;

- A joint UNEP/UN-HABITAT mission was sent to Mozambique to assess the impacts of the 2000 floods on the environment and on human settlements. It provided a framework for raising awareness of the extent to which Mozambique is vulnerable to natural disasters and also prepared a comprehensive programme for mitigating the effects of floods on the environment and reducing vulnerability to future floods.

- Mongolia's national government has undertaken a progressive change in its legal framework of disaster management, shifting disaster management from a military-oriented exercise to civilian-based programme, by incorporating and institutionalizing community based disaster management as one of the critical aspects of disaster management;

- A systematic approach has been taken by Cuba in land use planning and natural resource management in order to facilitate disaster reduction; and

- India's Gujarat State Disaster Management Authority (GSDMA) has developed a number of guidelines for vernacular and heritage buildings to make them disaster resistant, in addition to updating existing building codes.

2.4   Lessons learnt from effective practices

A number of key lessons can be drawn from the above examples and cases:
- Community based disaster management (CBDM) – Communities worldwide have been co-existing with disasters from early days. Their coping-mechanism towards

natural disasters has protected and nurtured the very existence of their civilization. Therefore, their indigenous knowledge and methodologies should be considered and where appropriate adopted, and imparted in reducing disaster risks at the global level.

- Decentralization in disaster management – Devolution of disaster management authority has been facilitating the process of reducing disaster risks by promoting transparency in disaster administration, empowering communities, and enhancing public processes in the course of deploying risk mitigation activities at the national and local level.

- Multi-sectoral and multi-stakeholder partnership in disaster management – Partnership is an important concept in the course of promoting integrated disaster management at all levels. Partnerships have facilitated holistic approach to disaster management involving all constituents. It has also helped to reduce redundancy and duplications of disaster management efforts, whereby co-operation and collaboration have been achieved.

- Focusing on health risk - This requires Identifying natural and man-made threats to people's health that might develop in crises and building scenarios for possible major incidents, including epidemics, bio-terrorism, and their health consequences. Health system will have to be made more resilient, by convening stakeholders to agree on ways to help cope with and manage threats (for example, evacuation and quarantine procedures, guidelines for the management and triage of mass casualties, prioritizing health services, disease surveillance and control etc.)

- Environmental sustainability in disaster management initiatives – A critical element in promoting environmental sustainability has been the institutionalization of disaster management practices within the environmental programmes at the national and local government levels. Government agencies must not only encourage and acknowledge action needed for risk management, it should also support it through legal frameworks and financial commitments.

- Safer Urbanization – As the world is urbanizing at a rapid pace, disaster management plans should be considered in the course of master planning of a healthy city. Emphasis needs to be placed in safer urbanization process in the course of mitigating disaster risks in urban and urbanizing places. Safer urbanization can be guided through the involvement of disaster management in urban planning. This is particularly true in how individual buildings are designed, used, managed and retrofitted.

- Disaster management in the development paradigm – The need for economic and social development should be reconciled with the need for effective disaster risk reduction. To prevent the vicious cycle of development-destruction-reconstruction, it is critical that disaster management is considered in development processes, putting special emphasis on vulnerable groups.

3.0 Guidance for future action and implementation

This section deals with proposed guidance for future action and implementation of the WCDR Programme of Action for 2005-2015, titled, 'Building the resilience of nations and communities to disasters'

3.1   Priorities for action

A number of key priorities for action have been identified in the Programme of Action. Of particular relevance to cluster 4 are those related to environmental impact and disaster risk assessments, capacity building, financial risk sharing, disaster prevention, protection of critical public infrastructure and community facilities, safer housing, community-based participation and partnerships, health issues, social safety nets, post-disaster recovery and community livelihoods.

Priorities for action for the next ten years will vary, depending on the particular situation and stage of development of Member states, but should take consideration of the following:

- There must be a coherent framework for reducing disaster hazards and risk (both natural and human-induced), with major emphasis being placed on the underlying risk factors as well as the need for emergency response. Such a framework should be based on an inclusive, multi-sectoral, coordinated approach that brings the combined resources of all stakeholders into risk management programmes. It is important to give priority to built-in, rather than added-on risk reduction measures in national development decisions.
- Disaster risk reduction should become an integral part of the public information and educational realms, both formal and informal, and at all levels. Multifaceted and continuous public awareness strategies for risk management should be formulated and managed, with professional, public sector, and private-sector resources and abilities.
- Reducing underlying risk factors must be based on sustainable pattern of natural resources management, practicing preventive land use planning and rigorously and comprehensively enforcing codes and regulations for safer buildings and construction.
- Physical infrastructures such as schools, hospitals, heritage sites and other critical network infrastructure such as roads, water supply systems, telecommunications etc. should be disaster-resistant to ensure continuity of urban functions at the time of a disaster. Programmes for the rehabilitation of existing infrastructure, and enforcement and adaptation of sound codes to new infrastructure, need to be implemented.
- Advanced technologies and methodologies for disaster risk reduction should be employed to greater level in both public and private sectors. Reducing underlying risk factors implies (a) appropriate actions based on good governance; (b) identifying, assessing and monitoring risks; (c) managing knowledge and preparedness for effective response and recovery; (d) stressing transparency and sharing of risk information, and (e) making information more intelligible to vulnerable communities.

3.2   Methods and approaches to implement recommendations

A plethora of methods and approaches to implement disaster risk reduction and management practices have been developed, relating to participation, decision-making processes, partnership, governance, knowledge and information, continual improvement, and livelihoods. These will have to be documented and disseminated to critical organizations and networks that are facilitating action at the local level.

The methods and approaches to be used in implementing recommendations to reduce all underlying risk factors need to appropriately match the priorities for action. These would

entail a good grasp of the dynamics of an innovative community or society working for disaster risk reduction, including:

- Community based disaster management - a large number of volunteers force and young leadership at community level will promote democratic process on the right direction of the government machinery for accomplishment of sustainable development of the nation. There should be a paradigm shift where disaster management at the community level becomes an integral part of the governance structure of a country, and in the overall development programming;
- Awareness of disasters (both natural and human-induced) and preparedness at the local level requires action by both governments and industry to minimize the occurrence and harmful effects of disasters and emergencies. This calls for identifying and creating of awareness of risks in a community, initiating measures for risk reduction and mitigation, and developing co-ordinated preparedness between the industry, the local governments and communities.
- Safer urbanization needs to be ensured by developing master plans at the local level that incorporate all aspects of disaster management. Also, there is a need to update and/or modify master plans at regular intervals to meet current needs of each city/village;
- The priority areas of concern in development would be to provide special consideration for the poor and of the most vulnerable groups in disaster planning. This needs to be ensured in a safe and secure environment where the threat and risk of disasters are effectively mitigated and managed; and
- Environmental methodologies can be useful tools in the management of disaster risks. Existing practices in environmental management, for example, environmental management systems (based on ISO 14001), or environmental impact assessments, need to incorporate elements of disaster management risk reduction in their processes and implantation. Further, coherent standards and safeguards also effectively reduce certain categories of natural and technological disasters, such as flooding, industrial emissions, and so on.
- Effective enforcement of building codes and regulations is essential to safer urbanization. Seismic retrofitting of existing buildings is also needed;

3.3   Target-setting for disaster reduction

The key to setting effective voluntary targets by Member States is the development of policy, legislative guidelines and frameworks to identify and set targets. Depending on the peculiar situation and stage of development of each country, targets can cover such issues as policies/programmes/projects, regulations, codes of practice, standards, professional ethics and community values. These targets should not only deal specifically with reducing risks, but also requires comprehensive integration into all stages of the disaster management cycle.

Some examples of voluntary targets, related to the issues outlined above include:
- all countries should develop and incorporate risk management frameworks in their national legislation that encourages community involvement and enhancement of local government roles in the decision making process of disaster mitigation policies.
- all countries should develop guidelines as national references for implementing local risk management practices (including indentification of hazards and vulnerabilities), particularly those that are community-based
- all cities/villages/townships should incorporate consideration of disaster avoidance and preparedness in their urban and industrial master plans

- all legislation and procedures related to environmental impact assessments of development projects should include measures taken to manage potential disasters and reduce related risks
- all urban infrastructure should be designed and located from the perspective of low vulnerability to disasters, for example hospitals, water treatment plants, fuel storage depots, waste treatment facilities, emergency transport links and so on.
- all countries seek to incorporate disaster risk assessments in urban planning, development and management – through codes, standards, guidelines, approval processes, and professional training.

3.4 Guidance on identifying targets

Reducing underlying risk factors is both a process and a goal, which can be quantitatively and qualitatively measured by products and processes combined. There is a clear need for comprehensive guidance on how to identify targets, including the need for consultations and dialogue with stakeholders in identifying measurable targets and indicators. This has to be done by involving the affected communities and local governments where disaster risks are high.

Strengthening critical public facilities and infrastructure such as schools, clinics, hospitals, water/power plants, communication and transport facilities, disaster warning facilities etc. is critical. For example, hospitals are among the basic facilities that must always be operational prior to, during and more so, immediately after a disaster. Safer hospitals represent a sense of security for a community and a factor for social trust. The voluntary target of ensuring that by 2015 all new and remodeled hospitals will be built safely in order to be able to continue functioning after a disaster is a factual, valid, verifiable, reliable, comparable and accurate indicator that can be monitored and evaluated on measuring reduction of underlying risk factors.

Identifying targets is facilitated by the effective expression of priorities, objectives, strategies and activities. Using the above example of a voluntary target, the particular vulnerability of the inhabitants of a hospital and the necessity for a functional hospital in the face of a disaster when medical services are highly demanded are strong arguments for the priority action of protecting and improving critical public facilities such as hospitals. Also, reducing the risk to hospitals is achievable as technically established guidelines, that do not vary much according to culture, are available. Moreover, success stories in Colombia, Costa Rica, Chile and other countries testify to how communities can be involved and effectively engaged in the whole process.

The Johannesburg Plan of Implementation, and relevant Millennium Development Goals, are also good guides in identifying targets for action. In addressing the vulnerability to disasters, the JPOI clearly places emphasis on an integrated, multi-hazard, inclusive approach to address vulnerability, risk assessment and disaster management, including prevention, mitigation, preparedness, response and recovery, as an essential element to a safer world.

4.0 Conclusions

4.1   Outline of proposed findings

Three sets of key findings can be drawn from the discussion, within the realm of reducing the underlying risk factors:

- Criticality of *governance* systems: Emphasis is placed on organizations working at various levels – national, sub-national, and local – and the governance structure that bind them together. This binding comes in the form of laws, legislation, rules and regulations, and procedures of functioning. This will enable clear transparency and accountability of the concerned organizations and individuals responsible for risk management activities. Obtaining political commitment from political leaders and public authorities will ensure that disaster risk reduction is a key issue of policies and programmes at the national and local levels and is well integrated with developmental planning activities.
- Criticality of *education* systems, awareness raising and capacity building: Clearly, success of risk identification, hazard mapping, and vulnerability assessments for disaster preparedness will depend on the degree of awareness of responsibility of each of the stakeholders, and the partnership systems built to bring them together. Programmes related to formal and non-formal education should go hand-in-hand with professional training and building decision-making capacities.
- Criticality of *technology* systems: Technology is taken in the broader meaning of the term, to include the capacities, management systems, and strategies/tools needed to develop and implement disaster preparedness plans. It includes financial resources that facilitate action at the local level.

The above three criticalities – governance, education, and technology – do not function in isolation. They go together, activities of each strengthening and supporting other issues, such as health (risk reduction measures focused on the prevention of suffering, disability and death due to disasters reduces mortality, morbidity and disability related to disasters) and environment (risk reduction measures that are integrated into natural resource and environment management practices help in ensuring that disasters due to environmental factors – flooding, landslides etc. – and impacts of disasters on the environment (water contamination, hazardous wastes etc – are reduced). Ensuring safety of residences and infrastructure through rehabilitation and implementation of codes will not only reduce the loss of lives and property, but also reduce the burden on emergency response teams at the time of disasters. The action to be taken, and the stakeholder responsible for the action, varies depending on the level of governance, from the household, community and city levels, to the national, regional and global levels.

There are several additional issues that need to be emphasized and taken into account:

- The duality – of risk factors and vulnerability – need to be addressed as a root cause in developing prevention programmes, and in making communities less vulnerable targets
- Risk reduction programmes need to look at human lifestyle choices and industrial development as well as natural disasters, and they often affect and are affected by each other, or occur simultaneously.
- Strategic frameworks need to emphasize the inclusive, multi-stakeholder approach both in risk reduction, and in disaster management. Communities, business sector and industry have a critical role in risk reduction, and in disaster management

- Special considerations/programmes need to be directed at poor communities that are often more vulnerable to risks. For example, diversified income opportunities for populations in high-risk areas enables the reduction of their vulnerability to disasters. Social safety-net mechanisms also need to be set up to assist the poor.
- Disaster retrofitting of local infrastructure – hospitals, water and waste treatment, fuel storages, transport should be carried out to make them less vulnerable to disasters themselves, and able to cope with the results of disasters.
- Health is a critical resource in disaster risk reduction as without it, death, injuries and suffering would remain unacceptably high. Focusing on mortality and its causes, health needs and systems, communicable diseases, the health of the vulnerable, environmental health, nutritional status, mental health and access to primary health care are vital in disaster risk reduction.
- The use of technologies and planning systems for disaster mitigation should be appropriate for the locality it is being targeted, taking into account, its unique characteristics.
- Promoting safer housing and infrastructure can be achieved through controlling of codes and regulation, raising awareness of house-owners on safety issues, and providing technologies to local governments and communities.

4.2   Areas for focus in the future

In building governance, education and technology systems that can facilitate risk reduction associated with disasters (whether human-made or natural), attention will have to be paid on the following areas:
- Reducing vulnerabilities and hazards: One of the key focal areas for the future is the need to identify the vulnerability of communities and regions to hazards and risks. This will form the basis for reducing the risk factors and will help build a framework of risk factors that is accessible to, and can be used by, a range of stakeholders working at different levels of governance, such as planners, engineers, managers, and other decision-makers.
- Development of management tools and interventions: A logical complement to risk reduction is the development and identification of policy measures and management tools that can help reduce risks from natural and man-made disasters. These will form a key link between an understanding of the pre-disaster vulnerability and risk management activities, and post-disaster relief and rehabilitation. Management tools focusing on mitigation and remediation will also have to be developed.
- Promotion of financial risk-sharing mechanisms, particularly insurance and reinsurance, public and private compensation-schemes to victims, and dialogue with industry to focus on vulnerable populations and communities. Establishment of national and regional insurance funds with international partnership should also be encouraged.
- Building of capacities and partnerships: Human capacity to comprehend the implications of disaster preparedness, and take action, will be the ultimate deciding factor in reducing the destructive impacts of disasters. These capacities will have to be built at all levels of governance, taking into consideration the subsidiarity of decision-making processes, and the inherent capacities of the responsible stakeholders. This can be operationalized through public-private partnerships in pre-disaster activities such as risk assessments and early warning systems. Attention should be placed on partnerships emerging from WCDR, for example, the proposal by the Government of Japan to

establish an international platform for disaster recovery and to support disaster-stricken countries.

A number of pre-conditions need to be met before concrete results can be seen. Most of these relate to the strengthening of public decision-making processes, from local to national. Disaster risk reduction needs to be an integral part of national and sub-national/provincial development plans, besides linking it to existing sustainability programmes such as ISO 14001 and Local Agenda 21, and larger integrated natural resource management programmes. . As indicated in the 'safer urbanization' section above, comprehensive urban development strategies and proper land use planning also go a long way in ensuring that the necessary conditions are set to reduce and mitigate the risk of damage from disasters.

Quite clearly, focus needs to be paid to developing mechanisms to bring new, and influential local stakeholders closer into the global action programmes and vice versa – for example, the business sector by creating new consultation and cooperation mechanisms. Capacities of governments (national and local), but also business groups in dealing with risk factors will need to be built, along with the strengthening of mainstream development actors to incorporate risk reduction into their decisions. Reducing the underlying risk factors is in deed a critical cross-cutting issue that runs through all stages of the disaster management cycle, from prevention, mitigation, preparedness, response, to recovery/rehabilitation.