Emergency Health Preparedness

Report and Documentation of the Technical Discussions held in conjunction with the 41st Meeting of CCPDM New Delhi, 19-21 July 2004

World Health Organization
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September 2004

The report and recommendations of the Technical Discussions on Emergency Health Preparedness, held in conjunction with the 41st meeting of CCPDM, were presented to the fifty-seventh session of the Regional Committee for South-East Asia. The Committee noted the report and endorsed the recommendations. The Regional Committee also adopted a resolution on the subject (SEA/RC57/R3).

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Part I

Proceedings*

* Originally issued as "Consideration of the Recommendations Arising out of the Technical Discussions on Emerging Health Preparedness" (document SEA/RC57/11 dated 9 August 2004)

1. INTRODUCTION

In conjunction with the forty-first meeting of the Consultative Committee for Programme Development and Management (CCPDM), Technical Discussions were held on the subject of "Emergency Health Preparedness" on 20 July 2004 under the Chairmanship of Prof Azrul Azwar, Director-General of Community Health, Department of Health, Republic of Indonesia. Mr Ahmed Salih, Director, Ministry of Health, Maldives, was elected Rapporteur. The working paper for the Technical Discussions, along with the Annotated Agenda, formed the basis for the Technical Discussions. Together with the CCPDM participants, special invitees from the civil society sector and sister UN agencies participated in the discussions.

1.1 Opening Remarks by the Chairman

The Chair welcomed the participants to the meeting and explained that for this year's Technical Discussions the topic of "Emergency Health Preparedness" had been chosen because of its relevance to Member States in the Region in the context of the changing global events, recent events in the countries, and the regular cycle of natural hazards affecting communities and populations. The Chair stated that this was a very good opportunity to recall the resolution on disaster preparedness adopted by the forty-fourth session of the Regional Committee and review the progress in the implementation of that resolution. The Chair invited the participants to engage in the discussions within the framework provided by the working paper and the Annotated Agenda.

1.2 Introduction of the Topic

The Chair requested Dr Luis Jorge Perez, Regional Adviser for Emergency Preparedness and Response, to introduce the working paper. Dr Perez's presentation emphasized that the key factor in emergency health preparedness (EHP) was risk management and its mainstreaming in the planning and implementation of health and development activities. Emergency preparedness and response became more effective when risks were identified as also the ways and means to address them.

The presentation further stressed on the explanation of risk management and related concepts. Risks were characterized in terms of populations affected and that risks varied between communities and within communities. Making risk management central to the disaster cycle was important since the risk approach could be applied at various phases of any emergency or disaster. The links between disasters and development were described with an emphasis on how risk reduction could actually assist in achieving the Millennium Development Goals (MDGs).

The regional situation in regard to emergencies was presented. It highlighted common hazards and vulnerabilities and differences in capacities. Although many of the Member States have common natural hazards, the issue of complex emergencies occurring in several countries of the Region was raised.

A case study of the current floods affecting three Member States (Bangladesh, India and Nepal) was described. An update on the current situation and a description of the response was presented highlighting the strengths, namely, decentralized response, intersectoral collaboration and community-based approaches. The community-based preparedness programme in Bangladesh was cited as an example of a sustainable approach. The success story of Gujarat, India, with health sector action from disaster to development was highlighted. Lastly, the effort of Nepal in addressing the risk of a major earthquake was presented as a focused but comprehensive effort for a specific risk. In conclusion, two important points were highlighted:

- Although Member States have addressed the issue of emergencies, there is a need for more concerted effort; and
- EHP is a cross-cutting issue and thus needs collaboration from all other programmes (e.g. communicable diseases control, mental health, information and advocacy).

The Chairperson summarized the issues raised in the presentation and then opened the floor for plenary discussions.

2. DISCUSSION POINTS

- The key issue in preparedness is strengthening the health infrastructure at all levels, particularly at the grassroots.

- The management of epidemics that follow a natural hazard (e.g. flood and cyclones) needs to be efficient. There is a need to have very good Standard Operating Procedures (SOPs) so that the emergency team and those involved in epidemic management and surveillance are able to manage the event efficiently without gaps.
- The Safe Community Initiative in Indonesia where capacities of communities are built to address specific hazards whereby risks and vulnerabilities in the communities are reduced was mentioned. The initiative also includes community advocacy to involve other sectors and, in the case of Indonesia, through the Red Cross/Crescent and the Scouting Movement. A joint committee under the President of the Republic of Indonesia is responsible for intersectoral collaboration.
- Complex emergencies, refugees and internally displaced persons, mainly due to political, ethnic and cultural issues, are priorities that need to be addressed.
- Logistics and resources are key issues in preparedness and response.
- The military has vast resources, particularly for logistics, but these may not be used in some cases of complex emergencies, e.g. refugees or internal displacement situations.
- There is a need to define the role of the health sector. Since the health sector cannot address emergencies by itself, it is important that the health sector describe clearly what it can deliver.
- Apart from the MDGs, environmental issues are an important area in which risk management principles can be applied.
- Preparedness for emergencies should be closely linked to communicable diseases control units to address issues of post-disaster surveillance and logistics support therefor.
- Movement of populations (e.g. refugees, internally displaced persons) has also increased the risk of these communities for communicable diseases such as HIV/AIDS. Addressing vulnerable populations through a strengthened health infrastructure is a key factor.

- Women and children are most vulnerable in emergencies. The example of Gujarat wherein services for pregnancy and child care were the big priorities after the emergency phase, was cited.
- The implications of small-scale disasters for a small country were immense. Ferry accidents, a possible oil tanker spill or an air crash were some aspects that would need guidelines and training for the health sector.
- Risk management is a key factor in emergency health preparedness. In the health sector, the integration of certain aspects of the departments of communicable and noncommunicable diseases may be an initial step towards this.
- Policy development and implementation can bring immense changes in emergency preparedness and response.
- There are recurring emergencies and one-off emergencies and the health sector should be able to respond to both types.
- Many of the issues which determine appropriate and efficient preparedness and risk management relate to governance.
- Strengthening the health system is key in preparedness. One aspect of this is effective routine immunization; this should be ensured.
- Community participation and social mobilization are important strategies in preparedness. Improving health intelligence is also an area that the health sector should address in emergency health preparedness.
- Information and communication is important prior to, during and after an emergency. Managing media means dealing with them even before an emergency and training them as well. During an emergency it is important to ensure that the flow of information within ministries of health and the larger public is consistent.
- Building capacity of the information/media units in ministries of health is key in this regard and policies are important to define this area of emergency management.
- There is a need to provide support to the health staff in remote areas to strengthen preparedness.

- Emergency preparedness and response envisages collaboration with other sectors., The health sector should be able to bring them in as partners.
- It is important to create a mechanism for multisectoral preparedness, planning and action either through a working group or a committee to avoid ad hoc response which very often is inadequate and inappropriate.

Dr Perez further shared the work of other countries in emergency preparedness and response:

Indonesia's efforts in rehabilitation and peace building in Aceh; Sri Lanka's management of the health issues in the Northeast and the floods in May 2003; DPR Korea's management of the Ryongchon blast; Timor-Leste's management of certain natural hazards in spite of having a fledgling programme; and Maldives' management of a recent ferry accident. He stated that these examples showed that the issues mentioned on governance, intersectoral collaboration, effective planning and collaboration among other health programmes are key in emergency health preparedness. Dr Perez then reiterated the issue of health MDGs and the contribution that can be made by risk reduction measures in their achievement.

3. GROUP DISCUSSIONS

The participants were divided into three groups and asked to identify the main challenges faced in emergency health preparedness and propose solutions to them. Group 1 was represented by Mr Pemba Wangchuk; Group 2 by Dr Ganthimathi, and Group 3 by Mr Anshu Sharma. All the three groups made presentations. The following is a summary of the outputs of the three groups:

Challenges and specific solutions

(1) Political will is needed as this sets the framework for policy and action.

- Advocacy and leadership of ministries of health
- Working and collaborating with media

- National and local plans and focal points needed
- Decentralized action in all phases of the emergency yields more sustainable results
- Resource allocation through budget at various levels of administration
- Institutionalization of disaster management
- Integrating risk management as part of development planning (one group noted that WHO had a key role in advocating this to the health sector as well as its sectoral partners and other UN agencies).

(2) Intersectoral cooperation

- Led by national/ provincial/district/local focal point with statutory provisions for authority
- National focal points represented by all relevant sectors
- National sectoral plans supported by a management information system
- Clear guidelines and defined roles for each sector
- Clear mechanism for this cooperation to be established that functions regularly.

(3) Community participation

- To be initiated during non-emergency phase with civil society organizations and other agencies under the national plan
- Training and awareness to prevent and deal with emergencies
- Community contingency action plans
- Private sector involvement
- Participation in vigilance and surveillance
- Recognition of services provided
- Active participation in the restoration of services
- Access to information
- Link with local authorities.

(4) Capacity building of the health sector

- Development and implementation of a clear policy
- Comprehensive and strategic planning based on risk assessments
- Monitoring and evaluation
- Logistics in all phases of an emergency
- Resource allocation and investment in EHP and risk reduction
- Systematic flow of information in prevention, preparedness and action during emergencies linked to surveillance systems.

(5) Intercountry cooperation

- To be initiated in the non-emergency phase
- Focus on common issues and resources
- Establishment of common platforms and mutual support
- Supported by good communication and transportation systems
- Networking
- Led and guided by WHO leadership.

4. BROAD STRATEGIES IN STRENGTHENING EMERGENCY HEALTH PREPAREDNESS

- Development of norms and policies
- Capacity building of institutions and human resources
- Coordination and liaison with other sectors and mobilization of resources
- Research and development
- Community involvement and strengthening

Roles of Member States and WHO

The discussions then addressed the strategies and roles of Member States and WHO in emergency preparedness and response with the working paper as the background document.

The key issues raised were:

(1) Revision of the International Health Regulations in relation to emergency preparedness and response.

(2) Community participation as a main strategy in addressing emergency health preparedness.

(3) Clarification of the role of WHO which participants defined as (in addition to those in the working paper)

- Advocacy in the health sector and other sectors and agencies
- Coordinating role in the health sector in all phases of disaster.

(4) Important role of civil society in community participation as compared to that of government.

The Chair pointed out that additions to the working paper were needed based on the comments made by the participants.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

(1) Risk management is the core method in the development of effective and efficient emergency health preparedness and response activities.

(2) Risk management should be incorporated in all development planning activities so that emergency and disaster management is well linked to sustainable development.

(3) Member States should build political will by developing policies and legislations and invest in their budgets for risk management initiatives and programmes and emergency health preparedness, response, recovery, rehabilitation and mitigation.

(4) Strategies described in the paper provide very good guidance for Member States and each of these strategic directions can be further refined in the context of individual countries and the risks they face.

Defining the roles of the health sector in Member States and that of WHO and other partners is the key to reducing disaster risk.

5.2 Recommendations

(1) Policies should be developed and legislation enacted to promote and incorporate risk management, vulnerability assessment and risk mitigation into national and local health and development activities and provide resources to support the implementation of such policies.

(2) Focal points and units should be identified in the ministry of health for emergency health preparedness and response.

(3) Disaster management in the health sector should be institutionalized.

(4) Comprehensive strategic planning based on risk assessments should be supported.

(5) A clear capacity building strategy should be developed according to the actual needs of each country on risk management, risk communication, emergency preparedness, information management etc. in collaboration with other relevant sectors.

(6) Disaster management principles and activities should be included in school, college and training curriculum.

(7) Coordination mechanisms should be developed for facilitating inter- and intra-sectoral collaboration and enhancing networking and mapping of resources among partners.

(8) Resource mobilization mechanisms should be developed to support response in emergencies.

(9) Informed decision should be promoted based on evidence and "lessons learnt" exercise.

(10) Communities should be involved in the development and implementation of disaster risk reduction efforts.

6. CLOSING SESSION

The Chair then invited the Deputy Regional Director to deliver the closing remarks. Dr Poonam Khetrapal Singh thanked the participants for their valuable inputs and said that these would be included in the working paper to be submitted to the Regional Committee. She stated that the challenges and strategies portion in the document would be suitably modified. For

preparedness to be enhanced and risks and vulnerabilities reduced, collaboration within and across different sectors needed to be maximized. For this, the roles of various sectors had to be clearly defined. A comprehensive strategic risk approach was needed which would include risk assessment, risk planning and risk management. Integrating risk management as part of development planning was desirable. A coordinating body at the highest level of government would be helpful in implementing this approach. Strengthening community participation needed to be encouraged. Dissemination of correct information was critical. All these needed to be done in a manner that resources were utilized optimally so as to meet the objectives of risk reduction.

The Technical Discussions Group proposed that the fifty-seventh session of the Regional Committee adopt a resolution on the subject. A draft resolution was accordingly formulated for consideration by the Regional Committee.

The Chair closed the session with a vote of thanks.

Part II

Resolution, Agenda and Working Paper

Resolution*

The Regional Committee,

Recalling World Health Assembly resolutions WHA34.26, WHA42.16, WHA44.41 and WHA46.6, and its own resolution SEA/RC44/R5 relating to emergency health preparedness and response,

Noting the rising frequency of natural disasters and man-made emergencies in recent years affecting human lives and causing socioeconomic burden,

Acknowledging the considerable efforts made by Member States in dealing with health emergencies with appropriate preparedness and response, and

Having considered the report and recommendations of the Technical Discussions on Emergency Health Preparedness, held during the 41st meeting of the Consultative Committee for Programme Development and Management (document SEA/RC57/11),

1. ENDORSES the recommendations contained in the report;

2. URGES Member States:

   (a) to further strengthen the development of national policies, legislation and programmes on emergency health risk reduction, by investing and incorporating risk management, vulnerability assessment and mitigation initiatives in health and development planning;

   (b) to strengthen the ministries of health, to take the lead in coordinating actions for preparedness and response to deal with health emergencies,

   (c) to enhance the capacity of the health sector and other key institutions for better emergency health preparedness in areas such as risk

* SEA/RC57/R3

planning and management, risk communication, information management and emergency management, and

(d) to support key activities such as mapping of resources, involving communities, collaborating with various sectors and mobilizing resources, and

3. REQUESTS the Regional Director:

(a) to intensify collaboration with Member States and relevant partners in strengthening emergency health preparedness and response comprehensively, including logistics, recovery and rehabilitation, mitigation and prevention activities;

(b) to facilitate timely action for enhancing inter-regional and intercountry cooperation and exchange of expertise and information, and

(c) to assist in the mobilization of resources for ensuring emergency preparedness and response in Member States.

Agenda*

1. Concepts in Risk Management, Disaster and Emergency Management and Development
2. Regional Perspectives on Emergency Health Preparedness in Member States
3. Issues, Challenges and Limitations in Emergency Health Preparedness
4. Strategies for Strengthening Emergency Health Preparedness in Member States
5. Roles and Responsibilities of Member States
6. Roles and Responsibilities of WHO
7. Conclusions and Recommendations

* Originally issued as document SEA/PDM/Meet.41/TD/1.1 dated 17 June 2004

Annotated Agenda*

1. Concepts in Risk Management, Disaster and Emergency Management and Development

(a) Risk Management

(b) Emergency Health Preparedness and Response and the Millennium Development Goals

2. Regional Perspectives on Emergency Health Preparedness in Member States

(a) Hazards and Risks in Member States

(b) Emergency Plans, Programmes and Policies in place in Member States

3. Issues, Challenges and Limitations in Emergency Health Preparedness

4. Strategies for Strengthening Emergency Health Preparedness in Member States

(a) Building Political Commitment in Mainstreaming Disaster Risk Management in Development Planning

(b) Capacity Development

- Mapping of Institutions and Experts
- Training in Context
- Development of Tools, Guidelines and Standard Operational Procedures

(c) Information Management

- Improving Health Intelligence

* Originally issued as document SEA/PDM/Meet.41/TD/1.2 dated 17 June 2004

- Development of Risk Communication Strategies
- Deriving Lessons from Events
- Implementing Revised International Health Regulations
- Using data to improve predictive capabilities

(d) Developing Prepared Health Facilities

(e) Strengthening Intra- and Inter-sectoral Collaboration

- Working with other health disciplines and sectors
- Resource Mobilization

5. Roles and Responsibilities of Member States

(a) Achieving the Strategies Mentioned

(b) Specific Roles in Preparedness, Response, Recovery, Rehabilitation, Mitigation and Prevention

6. Roles and Responsibilities of WHO

(a) The WHO Outlook: Health Action in Crises

(b) Specific Roles in Preparedness, Response, Recovery, Rehabilitation, Mitigation and Prevention

7. Conclusions and Recommendations

Working Paper*

1. PREFACE

During the forty-fourth session of the Regional Committee for South-East Asia, held in September 1991 in Kurumba Village, Maldives, Disaster Preparedness was part of several topics included for the Technical Discussions. At that time, Disaster Preparedness was an emerging concept for Member States, and for WHO itself. However, several recommendations concerning disaster preparedness were made by Member States as follows:

- Address the need for national preparedness plans;
- Establish emergency health programmes or emergency preparedness centres in Member States with WHO support;
- Expand collaboration between regions [the South-East Asia (SEA) and the Western Pacific (WPR) regions were specifically mentioned];
- Engage communities to participate in emergency preparedness and response activities;
- Link national plans with surveillance systems;
- Strengthen cooperation with NGOs, particularly the International Federation of the Red Cross and National Red Cross Societies, and
- Improve WHO communication and coordination.

A resolution (SEA/RC44/R5) was also adopted in support of the above-noted recommendations. Member States, together with WHO, have worked towards addressing priority risks and building capacities to reduce vulnerabilities. However, variable progress has been made in different Member States of the SEA Region.

* Originally issued as document SEA/PDM/Meet.41/7 dated 12 July 2004 and subsequently revised as recommended by the Technical Discussions group.

At the fifty-sixth session of the Regional Committee, held in New Delhi in 2003, the topic of "Emergency Health Preparedness" was selected for Technical Discussions at the 41st meeting of the Consultative Committee for Programme Development and Management, to be held in July 2004, borne out of the global, regional and national changes which have also changed the hazards and risks that communities face. Further, the last decade has also seen the growth of disaster and emergency management as a cross-cutting discipline in various sectors. Lately, through risk management and risk-reduction strategies, it has become a tool and mechanism with which to address and ensure sustainable development. As such, it is timely to discuss the issue of emergency health preparedness in the light of these developments. Reviewing the progress achieved with regard to previous commitments, and building on them will be challenges for the Regional Office in the years to come.

2. CONCEPTS IN RISK MANAGEMENT, DISASTER AND EMERGENCY MANAGEMENT AND DEVELOPMENT

2.1 Risk Management

"Risk management should be an integral part of the way organizations do their work, not an add-on or a one-off action. The modern risk management approach recognizes that a wide range of geological, meteorological, environmental, technological and socio-political hazards threaten society - individually and in complex interaction. Risks are located at the point where hazards, communities, and environments interact, and so effective risk management must address all these aspects."[1]

Risk management is the key tool in addressing the various phases in disaster and emergency management. It is the method that produces the most cost-efficient and appropriate result, particularly for emergency health preparedness, and even for broad health sector planning and development. The paper serves as a take-off point for discussions on how to use the various aspects of the risk management approach to improve emergency health preparedness, such as developing disaster management capacities; reducing vulnerabilities and disaster risks; making health facilities disaster-resistant, and converting disasters into emergencies. Using this approach, the end goal of

[1] John Twigg – Good Practice Review – Humanitarian Practice Network, Overseas Development Institute, No. 9, March 2004

having safer communities that can directly contribute to sustainable development can become achievable. The paper carries a glossary at the end which defines the various terminologies commonly used in disaster management for the reference of the reader, to enable a common agreement on these terminologies.

2.2 Emergency Health Preparedness and the Millennium Development Goals

Health and development are inextricably linked as health is both a means and an end to development. This being so, it is clear why the health sector plays a key role in disaster and emergency preparedness and response, and development of nations in general.

Sustainable development requires strategic approaches and among them is risk management of which a safer community is the main end goal. Managing risks goes hand in hand with developing capacity to adequately manage emergencies and disasters when they occur. There is a synergistic and cyclical relationship between disasters and development: the goal of disaster and emergency management is to reduce risks to create safer communities and to safeguard the existing as well as the potential gains of development. Conversely, development that is risk approach-oriented prevents and mitigates the deleterious effects of catastrophic events. A good example would be establishing good hospital systems and training health professionals to attend to affected populations of an earthquake. But then, in many cases, hospitals themselves cannot withstand tremors and earthquakes due to poor construction. It then becomes a case of development creating more risks and vulnerabilities; this should be prevented. This is an example from within the health sector. However, there are development issues impinging on wider areas, such as the environment, urban planning, and migration in which development may generate further risks and disasters if not addressed properly. The health sector does not only act to prepare and respond to disasters but needs to involve itself in other sustainable development issues. After all, a risk to health is a risk to achieving development, with the reverse being true as well. In all of this, risk management is the key.

This concept of disasters and development has become all the more relevant in the context of the Millennium Development Goals (MDGs). The eight major MDG goals (three of which are directly focused on health) sub-

divided into 18 targets with 48 indicators, most of which are targeted for completion by 2015, have created the road map for development in countries. The relationship between disaster preparedness and MDGs is further articulated in Section IV of the Millennium Declaration: Protecting our Common Future, which states as its objective: "to intensify our collective efforts to reduce the number and effects of natural and man-made disasters". Indeed, the achievements of MDGs are also directly linked to capabilities of countries and communities to act upon disasters in all aspects.

Let us take these specific health MDGs one by one:

MDG4 - Reducing child mortality

Reducing the infant and child mortality rates by two thirds

Children under five years of age are vulnerable to environmental hazards ranging from everyday risks of inadequate and unsafe water and sanitation, poor nutrition and unsafe food, and exposure to indoor smoke, to natural hazards with catastrophic consequences. The aftermath of catastrophic events can lead to loss of care-givers, displacement and further increased risks to the everyday hazards mentioned. All of these risks and hazards take a heavy toll of the psychological and physical health of children. Policies and strategies to reduce child and infant mortality should therefore incorporate risk-reduction interventions for all hazards in order to help address this MDG.

MDG 5 - Improving Maternal Health

Reducing maternal mortality ratios by three quarters

It is well-proven that improving the educational and economic opportunities of women improves their health, as well as the health of their children or family members. A greater access to information and income for women will directly redound on better health and security for the family. Risk-reduction strategies that engage and empower women will therefore result in better maternal and child health.

MDG 6 - Combating HIV/AIDS, Malaria and Other Diseases

Halt and begin to reverse the spread of HIV/AIDS and the incidence of malaria and other major diseases.

Clearly, a population with a high burden of communicable and debilitating disease increases the vulnerability of communities. Physical and psychological

effects of natural hazards or complex emergencies are more pronounced in communities where HIV/AIDS or tuberculosis prevalence is high. The risk for epidemics to occur after or during an emergency is also higher than usual for such populations. Recovery and rehabilitation in such communities is also slower as rebuilding the health system will have many needs and priorities.

Addressing the health of populations helps build safer communities and, conversely, safer communities perpetuate an environment where health is promoted. Needless to say, the risk management approach remains central to bringing together these missions as both are contributors to economic and social development.

Furthermore, as governments have linked MDGs with their Poverty Reduction Strategic Plans (PRSPs) and National Plans, it is also clear that resources and development aid may need to invest more in disaster preparedness and response. The most recent epidemics of SARS and avian flu are proof of this. Investing in disaster preparedness and prevention is also investing in achieving development in general, and in achieving MDGs.

It is in this development context that the health sector, with WHO support and leadership, should position itself to prepare, respond, reconstruct, mitigate and prevent disaster and emergency situations, with the broader objective of providing a better environment for the achievement of development, specifically with regard to the Millennium Development Goals.

3. REGIONAL PERSPECTIVES

Emergency Profile of the Region: Its Capacities and Vulnerabilities

The magnitude of disasters and their effects have considerable impact on the morbidity and mortality of populations of the SEA Member States where 25% of the world's population reside. Over a period of time:

- Of the world's disasters, 38% have occurred in the countries of the SEA Region;
- Almost two thirds (59.55%) of the total deaths in disasters worldwide have occurred in this Region;
- Of those affected by disasters in the world, 37% are from the countries of the SEA Region;

- Of the total number of Asia's refugees/displaced persons (7% of the world's), 19% belong to the SEA Region (e.g. Bangladesh, Bhutan, DPR Korea, India, Indonesia, Myanmar, Sri Lanka and Timor-Leste), and
- Out of Asia's (6% of the world's) total number of refugees, 2.7% are hosted in the countries of the SEA Region (e.g. Bangladesh, India, Indonesia, Nepal and Thailand)*.

In general, the trends show that contributions to total deaths and the number of people affected have remained the same over the past 15 years. However, the proportion of refugees and displaced populations from the Region has increased.

The various hazards present in the Region are summarized in Table 1:

Table 1. ***Summary of hazards present in the Region***

Hazards	Country
Earthquakes	Bangladesh, Bhutan, India, Indonesia, Myanmar, Nepal and Timor-Leste
Cyclones and storm surges	Bangladesh, (East and North-West) Indian Coast, Indonesia, Sri Lanka, Thailand and Timor-Leste
Tidal waves	Indonesia, Maldives
Floods	All countries
Drought	DPR Korea, Parts of India, Indonesia, Sri Lanka, Thailand and Timor-Leste
Tornadoes	Parts of Bangladesh
Volcanic eruption	Indonesia
Complex emergencies/ civil unrest and conflict	Bangladesh, Bhutan, India, Indonesia, Myanmar, Nepal, Sri Lanka, Thailand and Timor-Leste
Biological, chemical and radionuclear threats	Variable risks for all countries

Adapted from: Regional Strategy for Water and Sanitation in Emergencies

* IFRC 1993-2002

Member States in the Region have a wide range of differences in terms of issues and challenges in emergency preparedness and response. Although there are some hazards and vulnerabilities that are common to all countries in the Region, there still is a wide disparity regarding the following:

- National capacities in addressing disaster and emergency issues in all phases of the disaster cycle;
- Priority hazards to be addressed within countries;
- Socio-cultural and political systems which largely influence the occurrence of complex emergencies, and the coping, response and rehabilitation capabilities, and
- The coverage and quality of basic services prior, during and after a disaster or an emergency.

Six of the 11 Member States, namely Bangladesh, India, Indonesia, Nepal. Sri Lanka and Thailand, have reasonably developed systems for disaster and emergency preparedness and response. However, improvements in such aspects as multisectoral coordination; community initiatives, and mitigation activities, focusing on specific hazards may still be needed. Though Myanmar possesses response capabilities, it still needs more systems. It also needs to institutionalize its preparedness mechanisms. Timor-Leste has a nascent, and still quite transient, disaster and emergency management programme, while Bhutan and Maldives are yet to begin their respective programmes. The situation in DPR Korea is special in the sense that although it is an emergency situation where issues in communicable disease control, malnutrition, water and sanitation, and rehabilitation of health services are being addressed, there is no specific disaster and emergency preparedness programme that WHO is supporting.

Thus, it can be seen that the variety of hazards and risks that need to be addressed vis-a-vis national capacities provides a challenging setting for action regarding disasters and emergencies.

In recent years, initiatives to address this variety of hazards, risks and country needs have been established, albeit slowly, with extremely successful results. However, it is important to highlight the experience of Bangladesh in cyclone and flood preparedness which has reduced mortality and morbidity to very low levels in a period of three decades. Knowing its biggest risks and addressing them has made Bangladesh a success story in investing in preparedness and other aspects of disaster management.

Table 2: ***Summary of country capacities***

	BAN	BHU	IND	INO	MAV	MMR	NEP	SRL	THA	TLS
National Disaster Plan	+	+	+	+	-	+	+	-	+	+
Disaster and emergency programmes within the MoH (not just a focal point)	+	-	+	+	-	-	+	+	+	-
Related legislation	+	-	+	+	-	+	+	-	+	-

With changing hazards and risks in the Region and the capacities needed, risk management will provide a focused approach to preparedness, mitigation, vulnerability reduction, response, recovery and rehabilitation. WHO can work more effectively with Member States in this risk approach framework.

4. ISSUES, CHALLENGES AND LIMITATIONS IN EMERGENCY HEALTH PREPAREDNESS

By definition, preparedness is an ongoing, multisectoral activity, the objective of which is to initiate preventive and mitigation measures as well as to ensure that appropriate systems, procedures and resources are in place to provide prompt and effective assistance to disaster victims, thus facilitating relief measures and rehabilitation of services. Emergency preparedness and response at the country level calls for a multisectoral and multi-hazard approach: this means that there needs to be a single mechanism to coordinate, prepare and respond to all types of disasters.

The health sector plays a very catalytic role in emergency preparedness and response. It has a very important role to play even when in many cases it is not the lead organization for emergency preparedness and response. As first responders in any event, the health sector action reflects competent

governance. Appropriate and timely action of the health sector can spur further well-organized action as other needs arise in such an event. This catalytic action is most important in preparedness, mitigation and prevention activities where other sectors can follow the example of preparation of the health sector for various hazards and for risk reduction. However, preparedness is just one aspect where the health sector can act like a catalyst. It can also lead in the aspect of planning by influencing other sectors to address hazards and health and development issues within the risk-management approach. However, challenges and limitations remain.

Disaster management in the health sector remains primarily response-oriented, due to the absence of a comprehensive emergency health sector contingency plan

The responsibility of the health sector is to anticipate the impending health impact of potential emergency situations caused by disasters, and should include: vulnerable populations; additional health risks; specific action for casualty management; control of communicable diseases; types/quantity and location of needed resources; plan for information support and preparatory measures for appropriate response to reduce morbidity and mortality, using the existing infrastructure and available resources; post-disaster response evaluation, and cost-effectiveness.

In order to be effective, disaster planning by the health sector should use the risk management approach and be directed towards specific and realistic ends, such as making the best use of available resources, and planning for the main features of administrative response, such as location and general responsibilities of key officials.

Ad hoc health sector response due to inadequate orientation towards planned disaster mitigation, preparedness and response strategies

Inadequate orientation of the concerned health sector officials usually leads to a sense of helplessness and inefficient response among disaster managers. As a result, there is duplication of disaster response by more than one agency, ineffective resource management, delay in decision-making, and inappropriate international support due to unascertained local needs.

All emergency health sector strategies that have been planned and documented should be disseminated and properly communicated. A preparedness/simulation exercise should be undertaken to test the plan periodically. Pre-disaster planning does not merely consist of one-time operational plan but is a continuous process depending upon the awareness level among disaster managers; facilities and resources available, and regular risk and vulnerability assessments.

Effectiveness of health sector prevention, mitigation, preparedness and response are also dependent upon other sectors

A joint and uniform approach by the concerned sectors, together with the health sector, can minimize the pressure on the health sector being one of the first responders. Vertical and horizontal coordination and communication at different levels are necessary for facilitating mutual understanding and cooperation among different partners at the planning, preparedness, response and rehabilitation stages. Regular meetings, both formal and informal, at various levels of government would promote effective coordination.

Lessons and experiences are lost with the end of the emergency phase

Experience shows that despite a good administrative set-up and a well-formulated disaster management plan, disaster mitigation measures do not find required direction and yield desired results in the field. Memories of disasters usually fade away after the acute phase of events. Such a tendency is a major deterrent to the development and maintenance of disaster preparedness activities. This is one of the reasons for an ad hoc response during a disaster situation. Lessons and experiences are lost until the next disaster strikes again. At the same time, the knowledge and specific skills acquired at the field level are lost through transfers and postings of health staff.

In order to utilize the memory of past disasters for future benefits, technical institutions should be involved in the development of expertise and skills in this area; transfer of such expertise and skills from the central to the peripheral level or vice versa, and helping to further refine the disaster preparedness plan as required.

5. STRATEGIES FOR EMERGENCY HEALTH PREPAREDNESS

5.1 Building Political Will and Commitment in Mainstreaming Disaster Risk Management

The main issue for governments and not just ministries of health is to build political commitment for risk management in all aspects of disaster and emergency management. Commitment from legislators, policy-makers, other ministries (such as education, agriculture, and water and sanitation), local government and development partners is important to address risk reduction in a multisectoral approach. Advocacy to these stakeholders is a key intervention.

Disasters and emergencies cover three dimensions of development such as economic, social and environment. From an economic viewpoint, development resources are lost when a disaster wipes out the gains of investments. Also, emergency and disaster events shorten the life span of other investments. Disasters have a negative impact on the incentive for further investment and curtail potential gains. Policy-makers and development planners should consider that disaster management, besides saving people's life and property, is directly linked to socioeconomic development and maintaining the sustainability of the environment. Risks may be reduced if clear and practical objectives are linked to national and local policy as well as to the socioeconomic, environment, urban and regional development plans.

For that purpose, the precious lessons drawn from previous events should be learned and applied so as not to repeat the same tragic disaster cycle. By using lessons from the past, disaster reduction becomes an important tool for sustainable development which requires strategic approaches: among them is risk management which has safer community as its main end-goal.

> Disaster risk management should be an integral part of the way Member States do their work. Disasters are no longer seen only as unfortunate one-off events to be responded to, but also as deep-rooted and longer-term problems that must be planned for. The basic principle is that programming should adopt a risk management approach – a systematic approach to identifying, assessing and reducing risks of all kinds associated with hazards and human activities.

Addressing risks is not confined to a specific sector. Risk reduction should be everyone's business and although disaster mitigation and preparedness has tended to fall into the gap between development cooperation and humanitarian assistance, there remains an extensive range of options so that risk management can be incorporated into the work of various sectors at all levels.

5.2 Developing Capacities to Reduce Vulnerabilities

Capacity development covers a wide spectrum of audiences and methods which includes training for individuals, health professions, communities, coordination and collaborative workshops, and equipping institutions with tools, information and assistance in the exercise of their mandates and responsibilities. A comprehensive capacity development strategy for disaster risk management should be in place so that all means and interventions, without overlaps and duplication but with maximized use of resources, are available. Some of these include:

Mapping institutions and experts

Together with developing a comprehensive capacity-building strategy, mapping of institutional and community resources will be an important initial step in this initiative. Keeping a roster of experts is also an important step in going forward with capacity development systematically.

Training in context

Training that is need-based and adapted to contexts faced by Member States is the key in strengthening EHP. With the current Regional Office initiative of inter-regional training (Public Health Emergencies Management in Asia and the Pacific-PHEMAP) for a core of experts who will then take the training exercise to their respective countries, a balance of international standards and national needs can be ensured. Training for community-specific needs and risks is also an important investment to reduce vulnerabilities.

Development of Standard Operational Procedures

Development of country-specific standard operational procedures (SOPs) in risk assessment, management and communication will be the key in

strengthening capacity of institutions. SOPs for emergency management will also be important in building capacities for emergency health preparedness.

5.3 Improving Information Management: Predicting Emergencies and Disasters at Every Phase

This area includes improving surveillance, health intelligence, information collection and analysis and utilizing them in all aspects of the risk management cycle, such as risk assessment, early warning systems and preparedness activities. This is done to improve predictive capabilities and decision-making. Some of the specific issues are:

Improving health intelligence

Health intelligence covers collection of information through assessments, processing and analysis of various types of data and linking these to decision-making. A system should be in place for and by disaster and emergency managers for health intelligence to be part of the best practices in various contexts and phases of risk management.

Development and implementation of risk communication strategies

All risks have to be communicated to various audiences to engage maximal participation in preparedness activities, and in efficient response, recovery and rehabilitation, and prevention and mitigation. Strategic risk communication is a key factor in addressing and diminishing hazards and risks.

Deriving lessons from past events

A thorough and good documentation of disaster and emergency events or workshops participated in by all players in an emergency is an important exercise so that lessons can be drawn from events that have occurred. Actors in an emergency may have the opportunity to learn from their actions and apply them the next time a similar event happens. Dissemination of information from these activities and follow-up are also essential.

Implementing the Revised International Health Regulations

The revised IHR aim to provide a framework of action to prevent and control the spread of diseases or events which put people's health at risk in the ever-

changing global community. The aspects of the revised IHR which are related to risk management and emergency health preparedness include:

- Obligatory notification of all events of public health concern within their territory, irrespective of their cause (e.g. biological, chemical, natural), and
- Improved surveillance with the focus on ports of entries and borders.

Prediction capabilities of the vulnerable countries can be improved through analysis of disaster-related data on past disasters, and of technical surveys and papers. Such analyses may provide answers for unexplained disaster-related issues which are likely to arise while implementing the disaster management plan, or during epidemiological surveillance, disease prevention and control, and case management. They may also suggest remedial measures. Operational research should also be an integral part of disaster management in Member States.

5.4 Making Health Facilities Disaster-Resistant: Preparedness and Mitigation for Health Infrastructure

The interruption of the local health facility's operations after a disaster may be short-term (hours or days), or long-term (months and years). This is dependent on the magnitude of the event and its effects on the sector. Though the magnitude of these events cannot be controlled, their consequences can be minimized through relevant preventive and mitigation measures.

Safe structural component of health facilities

The experience of several countries reveals that it is possible to employ a specific methodology for the design and construction of health facilities against disaster impact that is capable of ensuring the safety of human lives, as well as ensuring the safety of the investment made in the facility.

Safety of non-structural component of health facilities

Under the non-structural heading of health facilities, those elements are included that are not part of the weight-bearing system of the building structure. Such architectural elements include: façades; interior partitions; roofing structures, and appendages and lifeline medical equipment and systems needed for operating the hospital facility, such as medical and

laboratory equipment; furnishings; electrical distribution systems; central oxygen and suction systems, and vertical transport systems (lifts/escalators).

Operationalization of hospital-specific emergency contingency plan

Mass casualties occur due to a natural or man-made emergency, causing disruption in many lives and families. During such a time, health establishments, particularly hospitals, should be able to respond in a timely and efficient manner. Hence hospitals should have an emergency contingency plan that takes into account the full range of possible emergencies and contingencies that can occur. Thus, they would be organized to meet the demands of medical care that result when a calamity occurs in a community or sometimes within a hospital. It should be part of the regional emergency plan and should network with other hospitals and essential services like police, fire and ambulance, etc.

5.5 Strengthening Intra- and Inter-sectoral Collaboration

Working with other health disciplines and sectors

Health is adversely affected in crises in various ways. But to begin with, the vulnerability of a community increases as its health status decreases. As such, it is important to work with other health initiatives in addressing the risks to health of a community prior to an event and consequently after. Various areas which are important for risk reduction, and specifically for emergency health preparedness are: communicable disease control; surveillance (e.g. HIV/AIDS); maternal and child health; water and sanitation; nutrition; biological, chemical and radionuclear safety, and environmental health in general. And in medium-term and long-term recovery and rehabilitation, the areas or disciplines of mental health, human resources and health systems development play important roles. Collaboration with these areas cannot therefore be overemphasized.

Working with other sectors will always be a challenge. Any risk-reduction effort will involve various players, and consensual collaboration by each actor will have effective and efficient results. Donor agencies, NGOs, other government agencies, and the private sector all have a role to play. Describing these roles is the first step in organizing any collaboration.

Intercountry cooperation for emergency health preparedness is important. Establishing a common platform for the exchange of experiences between countries and regions on common issues will pave the way for improving the national and local systems for preparedness and response.

Resource mobilization

Collaboration prior to, during, and after an emergency or disaster also provides opportunities for resource mobilization. If partners are involved, then there is more reason and credence for donor agencies to invest in hazard mitigation, vulnerability reduction, risk management and preparedness. By raising issues through proper and well-timed messages over appropriate communication channels, the donor community may respond appropriately to needs.

Member States of the Region, project planners and managers need to take a very broad view of the options available to them. They should be imaginative in their approach with regard to resource allocation and fund mobilization for disaster preparedness and response programmes. Identifying key risks and investing in reducing those which are a priority is always a sound management approach to resources.

5.6 Community Participation

It is well known that the first responders to an emergency situation are the local community. As such, they should have access to information and should be engaged in all emergency preparedness activities. It is also necessary to integrate community contingency action plans in the national plan for disaster and risk reduction. Education and training for the community during the non-emergency phase in cooperation and collaboration with civil society organization, private sector and other agencies are essential. All these may ensure active participation of the community to prepare for and respond to an emergency.

In putting together the mentioned strategies, there is a need to ensure that in all these the public is engaged so that they are an integral part in these issues, policies, plans and regulations. For these strategies to be meaningful, they should be geared towards empowering and engaging the general public. At the same time, they should translate into provision of financial resources and proper implementation. Vulnerable communities are the same

communities that translate and shape preparedness appropriately into action and as such should be of prime consideration in any advocacy or political effort. If this is ensured, political commitment can give rise to practicable and appropriate policies, guidelines, plans and investments for preparedness and response. Translating these plans and policies into development would increasingly involve people not just in response but more importantly in the other phases of the disaster, particularly preparedness. This makes preparedness activities more relevant to people and their everyday lives.

6. ROLES AND RESPONSIBILITIES OF MEMBER STATES

Although the needs of Member States are varied as per the hazards and risks they face, there are a number of roles and responsibilities that remain common to all of them. Apart from addressing the strategies mentioned, there are specific roles and responsibilities in various phases of disasters and emergencies which Member States should address for improved emergency health preparedness.

For Preparedness

Strengthen/establish health emergency preparedness programmes through:

- Awareness and advocacy for preparedness including policy and legislation development, and communication of messages designed for target audiences;
- Development of human resources for health: training of health staff in emergency preparedness and response at all levels of the health system, and
- Risk-reduction programmes:
    - Risk and vulnerability assessments as the basis for emergency and disaster planning in health facilities or various levels of the health system;
    - Address priority health issues of the population (e.g. maternal and child health, nutrition, and water and sanitation);
    - Development of early warning systems, and
    - Strengthening of supply management and logistics.

For Response

Improved coordination mechanisms, enhanced technical capacity and availability of timely and relevant health information:

- Development of coordination mechanisms with government agencies and relevant international organizations;
- Health information and intelligence supporting or integrated into the existing systems;
- Improved technical capacity for response, and
- Community involvement.

For Recovery and Rehabilitation

Ensure that health systems are functioning and include risk-reduction measures through the following:

- Medium-term assessments and prioritization of interventions, and
- Inclusion of mitigation measures in the reconstruction plan.

For Mitigation

Raise awareness on disaster mitigation and its link to development; use guidelines and standards adapted to the country situation with a special focus on health facilities.

7. ROLES AND RESPONSIBILITIES OF WHO

Health Action in Crises

WHO has taken into consideration this subject since its inception. This has resulted in resolutions by the previous World Health Assemblies. Resolution WHA46.6 with its precursors WHA28.8; WHA32.26 and WHA44.41 (on emergency relief operations) and WHA42.16 (on IDNDR) have all in summary:

- emphasized WHO's coordinating role in health and health-related aspects of disaster preparedness, response, rehabilitation, mitigation and prevention;

- recommended for Member States to strengthen capabilities in all phases of the disaster cycle, and
- recommended to the Director-General that WHO should strengthen its headquarters, regional and country mechanisms to respond to emergencies through better resource mobilization, early warning systems, communication and human resource component such as field staff.

At present the Emergency and Humanitarian Action Programme (now called Health Action in Crises (HAC) at WHO headquarters) continues to make these resolutions functional at all levels of the WHO system through a more focused results-based management framework covering disasters and emergencies in all its phases. Over a three-year period, HAC aims to:

- develop in-country capacity to coordinate preparation for response to and recovery from health aspects of crises promoting best practices, quality health intelligence, and health equity contributing to the realization of development goals;
- support provision of services by country teams in ways that support national institutions, within the overall response by the international community;
- support improvement of the surge or rapid response capacity from regional offices and headquarters and other qualified groups, and
- fulfil its commitment to increased action that will result in full engagement of technical and general management departments, in order to perform its key functions which include the following:
    - Tracking the evolution and progression of crises in countries ensuring that proper assessments are undertaken and acted upon;
    - Coordinating support for, and the strengthening of WHO country teams as they contribute to more effective preparation and response by governments, civil society and all other stakeholders;
    - Managing and re-routing funds to support technical back-up to country teams from specialist groups in headquarters and

regional offices, collaborating centres and/or technical networks;

- Evaluating the impact of crisis preparation and response work and disseminate the findings and lessons learnt;
- Establishing standards for optimal health action in crises, which conform to the levels of service to be provided by WHO in countries, monitoring organizational performance and instituting additional actions when necessary;
- Organizing a regular and focused programme of competency development with training and specific guidance;
- Building and maintaining effective links with other agencies in the UN system, NGOs, the Red Cross and the Red Crescent movement and crises – active donors;
- Mobilizing the right kinds of resources from donors for health action to anticipate, mitigate and respond to crises, and support repair and recovery work; tracking and reporting on these resources;
- Participating in planning and undertaking system repair and recovery after crises;
- Ensuring optimal operational, logistic, administrative, security, human resource and related support for Health Action in Crises work to maximize effectiveness of all WHO inputs in full cooperation with the joint UN system services, and
- Disseminating reliable information to interested parties and, when appropriate, to the wider public.

The current Organization-wide outlook is core to the country focus initiative and also supports to achieve MDGs. With over 50 countries currently in crises, the work of HAC is to support response, reconstruction and rehabilitation in the health sector through more innovative approaches so that the key components in laying the ground work for ensuring advances towards MDGs are set.

With a clearer articulation of the corporate strategy of Health Action in Crises, together with the use of the results-based management framework in

the Organization, WHO can commit itself to deliverables as per the needs of Member States. These are as follows:

For Preparedness

WHO shall provide Member States with advice, technical guidance, and tools for:

- information, advocacy and public awareness;
- preparedness planning, and
- training information and methodologies.

For Response

WHO will:

- act as a support system in crises leading in brokerage, coordination and planning;
- assist in resource mobilization;
- lead in rapid health assessment activities, and
- act as information bank for technical issues and training.

For Recovery and Rehabilitation

WHO will lead in:

- procurement of relevant supplies;
- coordination of experts and initiatives in the health sector, and
- information dissemination and planning.

For Mitigation

WHO will lead in:

- preparation and dissemination of standards;
- advocacy and resource mobilization, and
- planning, policy formulation and project development.

These are the deliverables which are expected at the country level with the collaboration of the Regional Office, and with technical and staff support. WHO is also expected to invest in staff who will be responsible to deliver these activities and outputs.

8. CONCLUSIONS

Risk management is the key approach in disaster reduction. It is a method that the health sector should apply in its work in emergency health preparedness and in its broader planning, development and implementation. In doing so, the health sector may show the way in the mainstreaming of risk management in the work of other sectors. Various strategies and options are available to address the challenges and limitations in the current disaster and emergency management. These are also needed to enhance preparedness and improve risk and vulnerability reduction. Although such approaches require financial and technical resources, the implementation of strategies are more the result of cooperation and collaboration of sectors wherein roles are defined, and resources are maximized so that goals and objectives are achieved.

Glossary

Disaster

A serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope with, using its own resources.

A disaster is the function of the risk process. It results from a combination of hazards, conditions of vulnerability and insufficient capacity or measures to reduce the potential negative consequences of risk.

Emergency

A sudden occurrence demanding immediate action which can be met within the coping mechanism of the affected community. It may arise due to epidemics, natural or technological catastrophes, civil strife or due to other human-generated causes.

Disaster risk reduction

The conceptual framework of elements considered with the possibilities to minimize vulnerabilities and disaster risks throughout a society to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards within the broad context of sustainable development.

Early Warning

The provision of timely and effective information through intensified institutions that allow individuals exposed to a hazard to take action to avoid or reduce the risk and prepare for effective response.

Early warning systems include three primary elements: forecasting of impending events; processing and dissemination of warnings to political authorities and population, and undertaking appropriate and timely action.

Hazards

A potentially damaging physical event or phenomenon and/or human activity which may cause loss of life or injury, property damage, social and economic disruption or environmental degradation.

Hazards can include latent conditions that may represent future threats and can have different origins (geological, hydrometeorological and biological) and/or induced by human processes (environmental degradation and technological hazards).

Mitigation

Structural and non-structural measures undertaken to limit the adverse impact of natural, human-generated or technological hazards.

Preparedness

Arrangements to ensure that, should a disaster occur, all those resources (e.g. financial, human, technical), expertise and services which may be needed to cope with the effects can be mobilized rapidly and deployed (includes the issuance of effective early warnings and the temporary removal of people and property from a threatened location).

Prevention

Activities to provide outright avoidance of the adverse impact of hazards and means to minimize related environmental, technological and biological disasters.

Recovery

The coordinated process of supporting disaster-affected communities in reconstructing their physical infrastructure and restoration of emotional, social, economic and physical well-being.

Response

Actions taken before, during and immediately after the occurrence of a disaster, to ensure that disaster effects are minimized and people are given immediate relief and support.

Risk management

A systematic approach to identifying, addressing and reducing risks of all kinds associated with hazards and human activities.

Risks

The probability of harmful consequences or expected losses (deaths, injuries, property, livelihoods, economic activity disrupted and environment damaged)

resulting from interactions between natural or human-induced hazards and vulnerable conditions.

Risk = Hazard x Vulnerability

Sustainable development

Development that meets the needs of the present without compromising on the ability of future generations to meet their own needs.

Sustainable development is based on socio-cultural development, political stability and decorum, economic growth and ecosystem protection which all relate to disaster reduction.

Vulnerability

A set of conditions and processes resulting from physical, social, economic, and environmental factors, which increase the susceptibility of a community to the impact of hazards.

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