

Towards Total Disaster Risk Management Approach

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1. Introduction

1.1 Total Disaster Risk Management Approach is relatively new in concept as well as in practice. Although a few countries have adopted risk management concepts and principles in disaster management, most countries, especially developing countries, remain unfamiliar with this approach. The prevailing practices, particularly in Asia, are more inclined towards managing response to disasters (which requires preparedness) than towards managing risks and the underlying conditions that lead to disasters (which requires, among others, risk assessment, vulnerability reduction, and capacity enhancement).

1.2 The focus on risk in the search for more effective approaches to disaster management stems from the compelling need to understand more the root causes and underlying factors that lead to disasters. The need to manage risk systematically has been widely appreciated and applied in the industrial, engineering and financial sectors early on (1940s). Risk management has introduced structured and systematic processes and procedures for examining risks and for making decisions based on them. The innovative application of the generic methodology of the risk management process to disaster management presents a fresh approach to understanding the nature of disasters, preventing their harmful effects, as well as seeking opportunities from their occurrences. In the context of total disaster risk management, it promotes coordination of functions and the diverse skills and disciplines and allows communities to undertake risk management activities that have been considered as the domain of engineering experts.

1.3 However, the terms “risk” and “total” have become management science jargons whose application to disaster management should be examined and explained well in order for them to be effectively communicated to policy makers and the general public. In this regard, the concept of “risk”, which in science connotes probability, needs to be understood adequately (and not to be confused with hazard). Also, the concept of “total”, which has been widely used in the context of total quality management, needs to be developed as it relates to disaster risk management. Since these have become the lingo of industrial, business and management professionals, the development and promotion of the total disaster risk management approach could enable professionals previously less concerned to have meaningful involvement in disaster management.

1.4 Considering that countries vary in stages and paces of applying concepts and strategies for disaster management, more so with the emergence of the total disaster risk management concept, the impetus, medium and forum for advocating and promoting efficiently this new approach need to be determined.

1.5 Commissioned by the Asian Disaster Reduction Center and the Asian Disaster Response Unit of the United Nations Office for the Coordination of Humanitarian Affairs, this study is an offshoot of the Consultative Meeting on Regional Cooperation in Natural Disasters held in Katmandu, Nepal, in July 2001, which concluded with the agreement to promote Total Risk Management Approach to Disaster Management. The study endeavors to develop the working concept and principles for that approach. It

discusses four essential component topics, namely, the review of current approaches to disaster management; the development of risk management concepts; the essentials of total disaster risk management; and the role of the community in total disaster risk management. It is written with current practitioners of disaster management as intended readers.

2. Review of current approaches to disaster management

2.1 Defining disaster

2.1.1 Disaster as a field of study and practice seems to have gone a long way since the inception of disaster sociology in 1917 with the dissertation of Samuel Henry Prince on Canada's worst catastrophe, the 1917 Halifax explosion. This field has since engaged many scholars from various disciplines to examine and acquire better understanding of the nature and concept of disasters. However, while there have been much dialogue and reflection on disasters in the social sciences, the myriad disciplinary perspectives on disaster phenomena seemed to have made its singular definition elusive.

2.1.2 At the outset of its advocacy for the International Decade for Natural Disaster Reduction or IDNDR, the United Nations promoted its working definition for disaster as:

A serious disruption of the functioning of society, causing widespread human, material or environmental losses which exceed the ability of the affected people to cope using its own resources. Disasters are often classified according to their cause viz. Natural or man-made. (DHA/IDNDR 1992)

2.1.3 However, many other international and local organizations and institutions have used different definitions. The definition promoted by the World Health Organization, which elaborates the impact on health, is worth citing:

*A disaster is any occurrence that causes damage, ecological disruption, loss of human life, or deterioration of health and health services on a scale sufficient to warrant an extraordinary response from outside the affected community or area. (World Health Organization, *Coping with emergencies: WHO strategies and approaches to humanitarian action*, 1995, Geneva)*

2.1.4 At a country level, the working definition of disaster in Australia is worth citing:

*A serious disruption to community life which threatens or causes death or injury in that community and/or damage to property which is beyond the day-to-day capacity of the prescribed statutory authorities and which requires special mobilization and organization of resources other than those normally available to those authorities. (Natural Disasters Organization, *Australian Emergency Manual*, 1987, Canberra)*

2.1.5 Notwithstanding the considerable disparity in definitions, they convey the essence of disaster as a serious condition beyond the normal capacity of the community to cope, thereby justifying external assistance.

2.1.6 A standard definition of disaster is yet to be universally accepted and used. Nevertheless, at best, the universality of disaster as a social experience has generated interest among scholars and practitioners, and has emphasized the importance of further studying disasters, their relationship to people and societies, and how they could be prevented or mitigated.

2.2 *Disasters are human-made*

2.2.1 Essentially, disasters are human-made. For, a catastrophic event, whether precipitated by natural phenomena or human activities, assumes the state of a disaster when the community or society affected fails to cope. Natural hazards themselves do not necessarily lead to disasters. Natural hazards like typhoons, and earthquakes, however intense, inevitable or unpredictable, translate to disasters only to the extent that the population is unprepared to respond, unable to cope, and, consequently, severely affected. The vulnerability of humans to the impact of natural hazards is to a significant extent determined by human action or inaction. Even the occurrence of recent climatic anomalies attributed to global climate change is traced to human activities.

2.2.2 However, disasters could, in fact, be reduced, if not prevented. With today's advancements in science and technology, including early warning and forecasting of natural phenomena, together with innovative approaches and strategies for enhancing local capacities, the impact of natural hazards, somehow could be predicted and mitigated, its detrimental effects on populations reduced, and the communities adequately protected.

2.2.3 An early scholarly insight on disasters, which, I believe, bears much relevance to the study of disasters today, is that of disaster sociologist Carr (1932) who first endeavored to understand disasters in terms of social action. This is evident in his passage:

Not even windstorm, earth-tremor, or rush of water is a catastrophe. A catastrophe is known by its works; that is, to say, by the occurrence of disaster. So long as the ship rides out the storm, so long as the city resists the earth-shocks, so long as the levees hold, there is no disaster. It is the collapse of the cultural protections that constitutes the disaster proper. (Carr 1932:211)

2.2.4 Carr's conclusion indicates that disasters are the collapse (i.e. failure or inadequacy) of cultural protection, a result of human activities and not of natural or supernatural forces; therefore, they are essentially human-made. This assertion assumes that human societies have the capacity to recognize the risks and factors that could lead or cause disasters and the appropriate interventions to control or manage them. It, therefore, conveys that disasters can be prevented or their impact on peoples and communities mitigated, and that human action or inaction to high risk and vulnerability to natural hazards could spell the difference.

2.2.5 Significantly, this view enables society to recognize the importance of community action such as capacity and capability building, including planning for the response to potential disasters, managing and mitigating their effects, as well as possibly preventing their occurrence or recurrence. Therefore, regarding disasters as events that can be managed rather than acts of God that are responded to when necessary, allows for purposive social action, including adoption of innovative development strategies, to prevent or reduce the loss of lives, limbs, property and the harm to the environment and the economy.

2.2.6 This notion of disasters as principally human-made and not attributable to fate presents a challenge to practitioners to reconsider the common use of "natural" and "human-made" in typifying disaster incidents.

2.3 *The disaster management cycle*

2.3.1 In present day practice of disaster management, the social action to cope with disasters could refer to any purposive undertakings before, during and after their occurrence. This is exemplified in the

prevailing concept that regards disaster management as a cycle with different phases, from preparedness through response, from prevention, mitigation and readiness, through relief, recovery and rehabilitation. The significance of this concept is its ability to promote the holistic approach to disaster management as well as to demonstrate the relationship of disasters and development.

2.3.2 This relationship has enabled disaster relief activities to adopt the development approach over the traditional ad hoc relief approach. Furthermore, the relationship between relief and development as a cycle reinforces the fact that disasters, however inevitable, could be managed through adequate planning and preparedness for response.

2.3.3 With reference to the disaster management cycle, programme and activities on prevention, mitigation and preparedness comprise the development portion, while relief and recovery comprise the humanitarian assistance portion with preparedness linking both types of efforts

2.3.3 There are two other conceptualizations of the disaster management phases. The straight line called *disaster management continuum* represents one. The other is the spiral that tries to illustrate the disaster cycle vis-à-vis the state or level of development, with its direction indicating a fall or rise in development. However, the basic concept of the *disaster management cycle* has prevailed and has remained widely used since the last decade.

2.4 *The sustainable development approach*

2.4.1 The *sustainable development approach* has facilitated better understanding of the relationship between disaster, its various phases, environmental degradation, and sustainable development.

2.4.2 As disasters cause harm and damage to people, property, infrastructure, economies and the environment, the goals of sustainable development are put to jeopardy. Disaster recovery and rehabilitation efforts require enormous funds that, amidst insufficient contingency funds, are taken out from other development programme that are planned or underway, thereby impeding development efforts. Therefore, it is important that disaster mitigation programmes are made an integral part of developmental programme. At the same time, efforts to enhance the capacities of communities and coping systems at various levels and sectors towards self-reliance and self-sufficiency in managing disasters effectively must be sustained. Understanding and identifying various types of vulnerabilities (human, social, economic, and environmental) as well as the nature of natural hazards are essential components of such efforts.

2.4.3 Moreover, this view has facilitated the adoption of disaster mitigation programme at the local level, which included structural and non-structural measures to protect populations susceptible to natural hazards, e.g. earthquake-resilient school structures. Also, in this regard, efforts in enhancing early warning and forecasting systems have flourished. As a desired consequence, investments and efforts for social and economic development are protected and sustained.

2.4.4 The development approach is essentially a holistic approach promotive of sustainable human development concepts. It facilitates the promotion of the “culture of prevention” and the incorporation of disaster management in development planning.

2.5 *The disaster management framework*

2.5.1 One of the more important conceptual frameworks the sustainable development approach has engendered is the *disaster management framework* that allows the development of a wide range of program activities to protect communities, property and the environment against disasters.

2.5.2 In this framework, four component approaches constitute the comprehensive and integrated approach to disaster management, namely, the comprehensive approach, the all-hazards approach, the integrated approach and the prepared community approach.

2.5.3 The *comprehensive approach* to disaster management entails developing and implementing strategies for different yet complementing aspects of disaster management, i.e. prevention and mitigation, preparedness, response and recovery, in the context of sustainable development.

2.5.4 The *all-hazards approach* concerns developing and implementing disaster management strategies for the full range of probable disasters. This approach has been useful in establishing standard protocols for addressing similar problems in a community, arising from different hazards and emergencies. However, several hazards that cause disasters may require specific response and recovery measures as well as specific prevention programs.

2.5.5 The *integrated approach* ensures that all organizations, including government, private and community organizations, are involved in disaster management. There may be some factors that organizations would take into account in determining the extent of their involvement. However, this approach promotes multi-sectoral and intersectoral coordination and reduces duplication and inefficiencies.

2.5.6 The *prepared community concept* concerns the application of all the foregoing approaches at the community or local level. It emphasizes the important roles and responsibilities of the members of the community in establishing disaster management programs and systems, and ensuring self-reliance and self-sufficiency in times of disaster.

2.5.7 While the disaster management framework has promoted a comprehensive approach that embraces not only disaster response but also prevention, preparedness and recovery activities, in actuality, much of the focus has been on disaster response planning and relatively lesser activities have been undertaken on disaster prevention, including the examination of the underlying causes of disasters.

2.6 *The developmental relief approach*

2.6.1 One important consequence of the development approach is the undertaking of disaster relief within the context of development. This is called the *developmental relief approach*. It demonstrates the shift from the traditional relief approach, which tends to regard the affected people as helpless victims requiring external assistance, to the developmental relief approach, which regards them instead as active people with capacities despite the effects of the disaster.

2.6.2 This shift necessarily entails the analysis of the capacities and vulnerabilities of affected communities, which shall define the nature of disaster assistance and the manner by which it is provided. This includes the analysis of the social, economic and demographic make-up of the community and its infrastructure. Through this analysis, specific relief and recovery requirements are determined and provided with the active participation of the community. Without this analysis, aid providers run the risk of extending inappropriate relief assistance that may lead to dependence, increased vulnerability and further social crises.

2.6.3 The tools for assessing relief requirements and analyzing capacities and vulnerabilities have to be further developed, fine-tuned, and promulgated among aid providers and disaster management practitioners. This will somehow facilitate local consultation and the provision of appropriate relief assistance through the existing social and political structures and systems. Consequently, it shall reduce

the propensity of relief providers to assume the determination of priority needs and beneficiaries and the management of relief at the community level.

2.6.4 Therefore, the development relief approach emphasizes the careful regard for existing strengths of the affected people and how relief could enhance these strengths and support local activities and initiatives toward reducing their immediate and long-term vulnerabilities.

2.7 *The vulnerability reduction approach*

2.7.1 The *vulnerability reduction approach* is a recent concept that complements existing approaches to disaster management. It views vulnerability as an interaction between a community, its environment, and hazards. This interaction can either result in sustainable human development or crises that can setback development.

2.7.2 The vulnerability of a community is characterized by its *susceptibility* or the degree to which it is exposed to the risk posed by hazards, and its *resilience* or the capacity to cope with harm. The vulnerability reduction approach addresses both susceptibility and resilience, by dealing with the causes of emergencies and disasters and strengthening communities at risk. It requires a number of coordinated activities including hazard and vulnerability assessment, prevention and mitigation, and preparedness for response.

2.7.3 Vulnerability assessment, which includes hazard analysis and risk assessment, allows the community to know how vulnerable they are and how hazards may affect them. Hazard mitigation, which includes measures to prevent hazards from causing emergencies or lessen their likely effects, protects the community from undue risks. Preparedness for disaster response, including planning and training, also contributes to prevent disasters by raising awareness to vulnerabilities and risks, thereby protecting the community and human development. The application of the vulnerability reduction approach entails multi-sectoral involvement, coordination and sharing of responsibility along with community.

2.8 *Disaster reduction initiatives*

2.8.1 Recently, initiatives that espouse the developmental approach with emphasis on disaster prevention and mitigation are referred to as disaster reduction initiatives. The emergence of disaster reduction as a concept that integrates development-oriented strategies and recent innovative approaches to disaster management such as vulnerability and risk reduction has presented a new perspective in disaster management and also opportunities to address the important areas of concern that have been less focused on. The concept has also been applied in policy development, usually in the context of sustainable development and long-term socio-economic development strategies.

3 **The development of risk management concepts**

3.1 *Tracing the origin of risk concepts*

3.1.1 The notion of risk continues to challenge human minds as in the ancient times of the Greeks when natural events were attributed to fate and the works of gods. However, the mastery of risks has now become the revolutionary idea that defines the boundary of modern times and the past. It has developed the notion that the future is more than a whim of the gods, and men and women are not passive before

nature. The understanding of risk, its measure and consequences, has made risk-taking one of the prime catalysts that drive our modern society.

3.1.2 The modern conception of risk is rooted in the Hindu-Arabic numbering system, but the serious study of risk began during the Renaissance, when people openly challenged traditional beliefs. Today, through the understanding of risk, choices are made more rationally and less based on tradition or long-held beliefs.

3.1.3 In time, the notion of risk has become associated with probability, uncertainty, occurrence or recurrence of events, the consequences of these events, and the human choices involved. It has been applied in game, science, engineering, and business, among other areas of socio-economic activity.

3.1.4 However, it is the theory of probability introduced by Blaise Pascal, from which the concept of risk flourished. Through its applications, the ability to define what may happen in the future and to choose among alternatives lies at the heart of contemporary societies.

3.1.5 The related concept of uncertainty further evolved when, in 1703, Gottfried von Leibniz argued that “[N]ature has established patterns originating in the return of events, but only for the most part.” Leibniz’s admonition --- “but only for the most part” --- provided the key to defining risk, without which everything would be predictable.

3.1.6 Today, the concept of risk has metamorphosed into a formal area of study called risk management that guides us over a wide range of decision-making in everyday life.

3.2 *Risk and disaster risk concepts: defining terms*

3.2.1 Important in the understanding of risk in the context of disaster is the differentiation among related concepts of hazard, vulnerability, and risk. In relation to disaster management, the working definitions for these are as follows:

3.2.2 Hazard is a phenomenon, an event or occurrence that has the potential for causing injury to life or damage to property or the environment. The magnitude of the phenomenon, the probability of its occurrence, and the extent and severity of its impact may vary. In many cases, these effects can be anticipated or estimated. Through careful study and understanding of the nature and prevalence of hazards, a community or public authority could anticipate future hazards and their impact and minimize the risk of a disaster.

3.2.3 Vulnerability refers to the susceptibility of a community to a hazard and the prevailing condition, including physical, socio-economic and political factors that adversely affect its ability to respond to hazards or disaster events. The community and its members may or may not be contributing intentionally or directly to the prevailing conditions. However, altogether, they create factors and situations that define the vulnerability of the community. Vulnerabilities can be manifested as physical, social, or attitudinal vulnerability.

3.2.4 Risk, essentially, is the probability that injury to life or damage to property and the environment will occur. However, in disaster management, risk refers to the combined susceptibility and vulnerability of the community to potential damage caused by a particular hazard within a specified future time period. Risk is rooted in conditions of physical, social, economic and environmental vulnerability that need to be assessed and managed on a continuing basis.

3.2.5 In further understanding the above concepts, a technical evaluation process is usually undertaken, commonly called *hazard assessment*, *vulnerability analysis*, and *risk analysis*. These are structured analytical procedures for identifying hazards and to estimate the probability of their occurrence and consequences given certain conditions. Taken altogether with a similar structured analysis of actual or potential vulnerabilities, these estimations are compared with a standard or criterion in order to decide whether or not an action is desirable to reduce the probabilities or to protect the people, property, or environment. Realistically, it is necessary also to consider to what extent perceived constraints of time, resources, or effect may impede the application of desirable countermeasures.

3.3 *Risk analysis and risk management as a process*

3.3.1 Risk analysis is the systematic use of available information to determine the likelihood of certain events occurring and the magnitude of their possible consequences. As a process, it includes the following activities: (1) identifying the nature, extent, and risk of threat; (2) determining the existence and degree of vulnerabilities; (3) identifying the capabilities and resources available; (4) determining acceptable levels of risk, cost-benefit considerations; (5) setting priorities relative to time, resource allocation, effectiveness of results; (6) developing methods to protect people and key resources and reduce overall losses; and (7) designing effective and appropriate management systems to implement and control.

3.3.2 Risk management is the systematic application of management policies, procedures and practices to the tasks of identifying, analyzing, assessing, treating and monitoring risk. As a process, it includes analyzing the risk, estimating its potential effects, and determining its importance in the scheme of things. It includes an evaluation of all the elements that are relevant to an understanding of existing or probable hazards and their effects on a specific community or environment. When this evaluation is considered in socio-economic and political terms, it enables the determination of appropriate vulnerability reduction, prevention and mitigation, as well as preparedness and response strategies.

3.4 *The context and challenges of risk management today*

3.4.1 The current state of disasters and the prevalence of disaster risks in the world present a challenge to all to address the problem of disaster risks as they impact on humanity, the environment and the future. Based on the recent trends of increased toll on human lives, properties, economy and the environment due to disasters and the inadequacy of response and coping systems, the disaster potential of natural hazards and the vulnerability of social systems have worsened.

3.4.2 The disaster potential of natural hazards is likely to intensify because of (1) increase in population and population density; (2) increase in population exposed to natural hazards; (3) increased use of hazard-prone land for productive purposes; and (4) expected increase in hazard intensity and/or frequency due to climate change and other human interventions into geo-chemical cycles.

3.4.3 As disaster potential increases, the coping mechanisms of many societies tend to become less effective. Moreover, vulnerability tends to increase due to the (1) speed of urbanization; (2) insufficient speed in building infrastructures to cope with urbanization; coupling of independent risk sources (interaction of natural hazards with chemical, technological, lifestyle, and social risks); (3) increase of mobility and cultural de-rooting (loss of traditional management capabilities); (4) increase of social pressure and conflicts; (5) insufficient management capacity; (6) lack of capacity for mitigation and contingency management

3.4.4 Furthermore, although risk assessment has played an important part in disaster management, the many uncertainties brought about by recent global developments have limited the reliability of recent

risk assessments in view of the following: (1) unpredictable global climate changes have a definitive but not fully understood impact on the occurrence and magnitude of disasters precipitated by natural hazards; (2) the combined effects of several natural phenomena aggravate the potential damage; (3) the estimation of probabilities and damage potential depend largely on social and political context; (4) because of population density and increased use of technologies, natural events trigger secondary impacts released from technologies and other human-made facilities; and (5) natural catastrophes interact with technological, social, and lifestyle risks.

3.4.5 This context of the current state of disasters and prevalence of disaster risks underscores the critical need to develop an effective and holistic risk management approach to disaster management. Moreover, the increase in risks generated by flawed development activities and the inadequacy of traditional disaster management practices to address them call for a new approach to disaster management. This approach is called disaster risk management.

4 The essentials of Total Disaster Risk Management (TDRM)

4.1 The rationale of the TDRM Approach

4.1.1 In today's fast changing global environment, the detrimental consequences of disasters on society, economy, natural environment, and even politics, cannot be overemphasized. More so in developing countries, the impact of disasters inevitably goes beyond their immediate devastation, as the perennial toll on human lives, properties and resources exacerbates poverty and setbacks economic development.

4.1.2 Global disaster statistics for 1996-2000 revealed staggering economic costs estimated at US\$ 235 billion and 425,000 lives lost (CRED International Disaster Database). Asia bears much of the brunt. Nearly half of the world's major natural disasters, recorded over more than three decades, occurred in the region. As a result, Asia has become the world's most disaster-prone region, absorbing 80 percent of the total affected populations, 40 percent of the total deaths, and 46 percent of the total economic losses (CRED statistics for 1997-2001).

4.1.3 Notwithstanding the fact that the United Nations, national governments and non-governmental organizations have made significant strides in promoting and establishing programs and strategies for disaster reduction and response, many countries and local communities, especially in Asia, are becoming increasingly vulnerable to disasters as technological, environmental, political and economic change combine to increase disaster risks. Moreover, socio-economic studies have revealed that the secondary effects and indirect costs of disasters have long-term effects on societies, regardless of their level of development

4.1.4 In Asia, the populations vulnerable to disaster risks are increasing. While Asian countries have developed at varying levels their respective capacities and capabilities in disaster reduction and response, many communities remain vulnerable to disasters as poverty prevails and populations and population densities grow rapidly. Unfortunately, the increasing prevalence of disaster risks and the growing vulnerability of communities to disasters tend to reduce the effectiveness of local capacities and coping mechanisms.

4.2 The challenge at hand: The pursuit of a holistic approach to disaster reduction

4.2.1 The enormity of the disaster problem at the global, sub-regional and local levels, including its detrimental impact on poverty and socio-economic development and security, and the growing

vulnerability of communities, continues to challenge the effectiveness of existing approaches, strategies and mechanisms for disaster reduction and response. While contemporary disaster management promotes the comprehensive approach that embraces all the phases of the disaster management cycle, in actuality, much focus has been on disaster response and relatively lesser activities have been undertaken on disaster prevention and mitigation. Moreover, the constant challenge to translate effectively disaster reduction policies and approaches into concrete program strategies and activities at the community and local levels still remains.

4.2.2 The foregoing context has characterized disasters as an important development issue and as a long-term problem that requires government priority attention and action. Particularly in Asia, the current situation has presented the critical need for a holistic and proactive approach to disaster reduction which focuses on disaster risks and the vulnerability of communities, and emphasizes multilevel, multidimensional (cross-sectoral), and multidisciplinary coordination and collaboration among all stakeholders in addressing gaps in the disaster management cycle. This approach has now evolved to be called the Total Disaster Risk Management Approach or TDRM Approach.

4.2 *The conceptual development and evolution of the TDRM Approach*

4.2.1 The TDRM Approach had been developed jointly by the Asian Disaster Reduction Center and UN OCHA Asian Disaster Reduction Unit through a series of consultative forum and workshops in the region. Since its inception as a course of action at the Consultative Meeting on Regional Cooperation in Disasters held Katmandu, Nepal, in July 2001, the initial concept of TDRM has been developed and presented to various organizations, academicians and disaster management practitioners, generating myriad comments and appreciation. Moreover, the approach was received positively during the conferences of representative of Asian governments held in January 2002 in New Delhi, India, and by non-government organizations from Asian countries held in February 2002 in Kobe, Japan. It was also shared to important regional organizations in June 2002 in Bangkok, Thailand. In pursuit of TDRM, a regional workshop participated in by government delegates, was held in August 2002 in Kobe, Japan, which explored possible ways of piloting TDRM at the local level. The strengthened cooperation and collaboration among governments, international and regional organizations, and NGOs in the region effectively facilitate the promotion and adoption of the TDRM Approach at various levels.

4.3 *The essence of the TDRM Approach*

4.3.1 The TDRM Approach builds on the gains of the International Decade of Natural Disasters, the International Strategy for Disaster Reduction and other related endeavors. It integrates existing knowledge and techniques on disaster reduction and response, and risk management. Inherent to this approach is effectively communicating these knowledge and techniques at all levels and facilitating the appreciation of governments of the relevance of disaster risk management in achieving sustainable development objectives.

4.3.2 As a working definition, the TDRM Approach is a purposive viewpoint that addresses holistically and comprehensively the various concerns and gaps in the disaster management cycle. In this regard, it necessarily focuses on the underlying causes of disasters, the conditions of disaster risks and the vulnerability of the community. It also emphasizes multilevel, multidimensional and multidisciplinary cooperation and collaboration, in achieving effective disaster reduction and response. This approach intends to integrate, complement, and enhance existing disaster reduction and response strategies.

4.3.3 Consequently, the approach promotes effective integration of stakeholders' action through multilevel, multidimensional and multi-disciplinary coordination and collaboration, a critical strategy

toward improving disaster reduction and response. Also, it facilitates broad-based participation in policy and program development in disaster reduction and response as they relate with other development concerns, such as poverty reduction, land use planning, environmental protection, and food security..

4.3.4 However, in adopting the TDRM Approach, accurate and reliable hazard, vulnerability and disaster risk information is vital. The approach attaches great importance to hazard mapping and vulnerability assessment as a fundamental tool for good decision-making and efficient sharing of disaster risk information.

4.4 *The objectives and strategies of the TDRM Approach*

4.4.1 Addressing disaster reduction issues and concerns more holistically, the strategic objectives of the TDRM Approach are three-fold

- 1) To address holistically and comprehensively the various concerns and gaps in the different phases of the disaster management cycle by considering the underlying causes of disasters (i.e. the conditions of disaster risks) and the broader set of issues and contexts associated with disaster risk and its management;
- 2) To prevent, mitigate, prepare for, and respond effectively to the occurrence of disasters through the enhancement of local capacity and capability, especially in disaster risk management (i.e. recognizing, managing and reducing disaster risks, and ensuring good decision-making in disaster reduction and response based on reliable disaster risk information); and
- 3) To promote multilevel, multidimensional and multidisciplinary coordination and collaboration among stakeholders in disaster reduction and response as they ensure the participation of the community, the integration of stakeholders' action, and the best use of limited resources.

4.4.2 In pursuit of these objectives, five implementation strategies for the TDRM Approach are proposed. In view of the holistic nature of the approach, the component strategies are inter-related and complementary with each other.

1) *Achieving effective disaster reduction and response through multilevel, multi-dimensional and multidisciplinary cooperation and collaboration*

The increasing prevalence of disasters has become a growing concern of various sectors, including governments and non governmental organizations. The enhanced awareness of these sectors on the impact of disasters on sustainable development and on the limitations of current local capabilities and capacities allows for common recognition among stakeholders of the need for strengthened cooperation and collaboration at all levels.

With the immensity and complexity of the disaster problem, no one stakeholder could effectively address the problem alone. Cooperation in disaster reduction activities among governments at national and local levels, non governmental organizations and various sectors of the communities is essential. The broadened participation of relevant sectors, such as environment, finance, industry, transport, construction, agriculture, education, health, and media among others, in disaster reduction activities, allows for greater understanding of local vulnerabilities and risk to disasters and integration of actions of stakeholders.

At the international level, disaster reduction has become a fundamental component of international cooperation. Sustaining and strengthening intra-regional regional cooperation, including networking

among governments and concerned organizations would facilitate a holistic response to disaster risk issues and concerns.

In this regard, effective mechanisms to initiate and sustain multilevel, multidimensional and multidisciplinary collaboration and cooperation are important and necessary. Networking is one such mechanism that can sustain linkages and pull together organizational strengths and capacities, including resources and expertise for disaster reduction activities. It is also a rational and viable strategy to overcome organizational constraints through complementation.

Among the possible program activities for this strategy are: (a) Networking for sharing of information, expertise, resources, including best practices in disaster reduction (e.g. Asian Disaster Reduction and Response Network); and (b) Collaboration and cooperation in local capacity building in vulnerability and risk assessment, disaster risk information management and mass media, and psychosocial services, among other marginalized issues.

2) *Making decisions based on reliable disaster risk information from hazard mapping and vulnerability assessment*

The TDRM Approach promotes good decision-making and effective use of limited resources. It attaches great importance to hazard mapping, vulnerability and risk assessment as a fundamental tool for generating reliable disaster risk information which serves as basis for making decisions on disaster reduction and response interventions.

The appreciation of the relevance of disaster risks information encourages critical involvement of various sectors in disaster reduction. For example, some major financial institutions and development assistance agencies are now beginning to require risk assessment and risk management processes to be included in new infrastructure development projects. This broadening involvement of various sectors previously less concerned with disaster reduction and response is a positive development.

However, many local communities remain unfamiliar with the methods and uses of hazard mapping, vulnerability and risk assessment. In pursuit of a holistic approach to disaster reduction, it is important that sectors are aware of prevalent risks and prevailing vulnerabilities and the methods to assess them. Moreover, it is important that vulnerabilities are assessed and understood in a broad context, including human, socio-cultural, economic, environmental and political dimensions.

Among the possible program activities for this strategy are: (a) Promotion of hazard mapping, vulnerability and risk assessment at the local and community levels; (b) Collaboration and cooperation in vulnerability and risk assessment of critical facilities such schools and hospitals; and (c) Collaboration and cooperation in assessment and enhancement of early warning systems.

3) *Enhancing coordination and integration of stakeholders' action through good communication and efficient exchange of relevant and reliable information*

Information plays an extremely important role in effective disaster reduction and response. The wise and timely use of disaster risk information could mitigate, if not prevent disasters. Moreover, good communication and exchange of critical disaster risk information could enhance coordination and integration of stakeholders' actions in disaster reduction and response.

However, ensuring the availability and accessibility of accurate and reliable disaster risk information when required entails an efficient system for information sharing. In this regard, an efficient disaster risk management information systems is important. Moreover, it should be effectively linked to local early

warning systems, local authorities and the media to ensure effective use of disaster risk information for public awareness and education, among others.

Among the possible program activities for this strategy are: (a) Enhancement of disaster risk management information systems at various levels; (b) Capability and skills development for media practitioners and school teachers; and (c) Integration of information technology and local knowledge; and (d) Strengthening of early warning systems for natural hazards, including climatic anomalies attributed to climate change.

4) *Ensuring that appropriate enabling mechanisms are in place, including policy, structure, capacity building, and resources*

As disaster reduction becomes essential to sustainable development, disaster reduction policies and measures need to be developed and institutionalized at national and local levels. They should enable communities to be resilient to natural hazards while ensuring that development efforts do not increase vulnerability to those hazards.

In pursuit of the TDRM Approach, the following enabling mechanisms for effective disaster reduction are necessary:

(1) *Policy.* A clear and comprehensive policy that defines the objectives and commitment of the government, organization, or community to disaster reduction and response efforts, is important. This may assume the form of legislation, policy guidelines, promulgated plans, or protocols. A policy developed through a strategic and consultative planning process could effectively address the identified gaps in the disaster management cycle.

(2) *Structures and systems.* Organizational structures and systems that facilitates and ensures coordination of stakeholders' action and contributions should be in place. This involves the establishment and strengthening of focal points and national and local coordination bodies for disaster reduction and response activities, and disaster management systems.

(3) *Capacity enhancement.* The enhancement of national and local capacity to establish and implement disaster reduction and response measures, especially for vulnerable sectors and communities, should be a constant undertaking. This includes education and training in disaster reduction and related fields.

(4) *Resources.* The identification and provision of resource requirements, including funds and trained human resources, are important. This includes means to access and use authorized fund appropriations for disaster reduction and response.

These enabling mechanisms are more effective when sustained by institutional enthusiasm, political will and commitment, and responsible focal points and advocates in government.

Among the possible program activities for this strategy are: (a) Capacity enhancement for national and local disaster coordination bodies; (b) Policy and program development for disaster reduction (including development of disaster reduction plans); and (c) Resource generation and management.

5) *Implementing the disaster risk management process from the national level to the community level*

The disaster risk management process is a process for good decision-making and ensuring the best use of limited resources. It applies the standard principles, process and techniques of risk management to

disaster management. The process presents a framework and systematic method for identifying, analyzing, assessing and managing disaster risks in six systematic steps:

- (1) *Establish the disaster risk context.* This step establishes the strategic, organizational and risk management context in which the rest of the process takes place. The strategic context refers to the operating environment (i.e. stakeholders, legislations, standards, etc.); the organizational context to organizational goals, objectives and policies; and the risk context to specific disaster risk issues. The criteria against which the risk will be assessed are established through consultation, and the structure of the analysis is identified.
- (2) *Identify the disaster risks.* Second, identify the disaster risks. This step identifies what, why and how hazards or certain events or occurrences could translate into disasters. The sources of risks, areas at risk, and the existing disaster risk reduction measures are also identified.
- (3) *Analyze the disaster risks.* This step determines the existing controls and analyzes disaster risks in terms of likelihood and consequences in the context of those controls. The analysis should consider how likely is an event to happen, and what are the potential consequences and their magnitude. The analysis results in an estimation of the level of risk.
- (4) *Assess and prioritize the disaster risks.* This step compares estimated levels of risk against the pre-established criteria and ranks disaster risks to identify disaster management priorities. (Acceptable vs. treat risk)
- (5) *Treat the disaster risks.* This step involves identifying a range of options for treating the priority risks, such as options for prevention, preparedness, response, and recovery, selecting intervention options, planning and implementing intervention strategies. Moreover, the specific disaster risk management plans for priority disaster risks are developed, funded and implemented.
- (6) *Lastly, monitor, review and communicate.* Since few risks remain static, it is important to monitor and review the performance of the disaster risk management system (Steps 1-5), the changes that might affect it, and ensure that the disaster risk management plan is relevant. It is therefore necessary to undertake the disaster risk management process regularly. (The entire process is iterative.)

Among the advantages of using the standard risk management process to disaster management are: (a) it is a formalized and systematic decision-making process; and (b) its adoption provides a common language, system, and process to all organizations and sectors involved, thereby facilitating coordination and collaboration among them and integration of actions.

In general, this process aids decision makers in determining possible outcomes of risks and undertake appropriate measures to control or mitigate their impact based on reliable information and available resources. In this regard, disaster risk management promotes good disaster management practice, and therefore, should be incorporated in disaster reduction plans and programs, and implemented in all sectors.

Among the possible program activities for this strategy are: (a) Human resource development in disaster risk management process; (b) Collaboration in disaster risk assessment of specific vulnerable communities; (c) Assessment of disaster risk reduction efforts (including development of methods of measure).

5. The TDRM Approach: Towards effective disaster reduction policies and programs

5.1 Moreover, the TDRM Approach could serve as a framework for action, particularly in identifying and addressing the gaps in existing policies, programs, structures, systems and resources towards more efficient and effective implementation of disaster reduction and response activities

5.2 Of fundamental importance to the TDRM Approach are hazard mapping and risk and vulnerability assessments. These diagnoses help ensure good decisions in choosing appropriate interventions and the best use of limited resources.

5.3 Overall, the TDRM Approach presents as its added value quality and credible disaster management, enhanced efficiency in disaster reduction and response, cost effectiveness through sound allocation of limited resources, and therefore good governance

5.4 The greater challenge at hand is to explore opportunities and initiatives to adopt the TDRM Approach at local levels. However, it is crucial to build consensus and political commitment at the highest level for adopting the TDRM Approach as a strategy to address effectively the prevalence of disaster risks, the current state of disasters, and the existing gaps in the disaster management cycle. Political will, commitment to action and nobility of purpose could spell a big difference.

6. The TDRM Approach: Ensuring the integration of local community action in disaster reduction and response

6.1 A participative, community approach in TDRM is essential. The effectiveness of disaster risk management interventions could be ensured when the community and people at risk are directly involved in the disaster risk management process. It is also critical that any disaster risk management plan is dynamic and remains relevant to the community and the roles and contributions of the members are defined.

6.2 Through the participative approach, the determination of risks and the intervention measures are not imposed on the community, but rather accomplished by the very people concerned. Moreover, greater emphasis is placed on local knowledge and the indigenous ways of knowing, rather than on expert knowledge and technologies. This allows also for a shift of focus from hazards to socio-economic vulnerability (level of poverty, human development, etc.) of the communities at risk.

6.3 Furthermore, community involvement not only allows problems to be defined correctly and responsive measures to be designed and implemented, but also allows people to respond to disasters more efficiently and effectively with existing local resources. Also, community based-activities tend to be multisectoral, thereby reinforcing local organizations, and enhancing consciousness, awareness and critical appraisal of disaster risks and their inter-dependence. Altogether, they increase the community's capacity and people's potential for reducing their vulnerability to disasters.

6.4 The pursuit of the TDRM Approach, with special regard for the involvement of the community, is in consonance with the Yokohama Strategy and Plan of Action for a Safer World: Strategy for Disaster Reduction for the Year 2000 and Beyond. The Strategy advocates for, among others: (1) adoption of a policy of self-reliance in each vulnerable country and community, comprising capacity-building as well as allocation and efficient use of resources; and (2) involvement and active participation of the people in disaster reduction, prevention and preparedness, leading to improved risk management.

6.5 In view of the current state of disasters in Asia, the need for improved disaster management in all levels is increasingly viewed as a development priority in the region. The development of the TDRM Approach is a major progress in response to this priority need.



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