

RISK AND DISASTER: CONCEPTUAL OVERVIEW

A standardized and unified understanding of the concepts is crucial to achieving the ends of Risk, Disaster, and Humanitarian Communication (RDHComm). To effectively provide the link between the government/technicians and the people, through communication is a top priority. Through RDHComm, no disaster-related term should ever be considered as too technical for the appreciation of anyone.

Now, let's go over these basic concepts and see how our knowledge is crucial to our understanding of RDHComm and how they can help you save our community.

DEFINING THE CONCEPTS

The United Nations Development Program (UNDP) was responsible for formulating these definitions which have now become globally-accepted. These definitions are considered standards as they are recognized by governments, international media, think tanks and by organizations in the business of DRRM. The Red Cross and the Philippines' National Disaster Coordinating Council (NDRRMC) echo the definitions crafted by the United Nations International Strategy for Disaster Reduction (UNISDR).

Before we push for the more technical and complex terms of disaster risk reduction and disaster risk management, let's first establish a very clear understanding of what a disaster entails.

Disaster  end result

Until today one can make a conclusion that the basic definition of a disaster remains highly contested.

However, since the International Decade of Natural Disaster Reduction (IDNDR) the various scientific understandings of disaster have culminated in a globally accepted definition. The UNISDR (2009) defines a disaster as: ***“A serious disruption of the functioning of a community or a society involving widespread human, material, or environmental losses and***



impacts which exceeds the ability of the affected community to cope using only its own resources.”

Disasters may often be caused by nature, but it can also have human origins or what is sometimes called human-induced and man-made disasters. In this respect, disaster occurs with the existence of hazards that impacts vulnerable people, whether natural or man-made (IFRC, n.d.).

Let's see how this definition can be expressed clearly. *First*, the emphasis of the definition is on “a serious disruption”. One can therefore expect a disaster event to be something which significantly changes the “normal”. Meaning, it is an event which the majority of the affected community will perceive as removing them from the “normal”. Second and most important is the distinction which the definition places on abnormal events and an event which we can classify as being a disaster. If the event “exceeds the ability” of the affected community to handle the consequences by making use of all their resources, then the event can be classified as “a disaster”. *Third*, note should be taken of the concept of “community”. Various disciplines define “community” quite differently. A community is a collection of people sharing common interests and values. Despite being culturally diverse, mobile or unstable, members of a community communicate with or on behalf of each other in order to achieve a mutually beneficial outcome – they are bound together by a common goal, their sense of belonging and a sense of place.

The UNISDR claims that disasters are often described as a result of the combination of: the exposure to a hazard; the conditions of vulnerability that are present; and insufficient capacity or measures to reduce or cope with the potential negative consequences. Disaster impacts may include loss of life, injury, disease and other negative effects on human physical, mental and social well-being, together with damage to property, destruction of assets, loss of services, social and economic disruption and environmental degradation.

It is important to note that the term “natural disaster” has not been used because it is inaccurate and misleading to refer to them as merely “natural disasters”.

To illustrate whether it is really natural disaster or not, we should start with defining what disaster risk is. **Disaster risk** can be determined by the presence of three variables: **hazards** (natural or anthropogenic); **vulnerability** to a hazard; and coping **capacity** linked to the reduction, mitigation and resilience to the vulnerability of a community associated with the hazard in question. For example, let's assume we are dealing with a poor farming community (i.e. an informal settlement situated in the 1/50 year flood-line). Certain socio-economic and political dynamics in the country force poor communities to settle in unsafe conditions (e.g. distance from employment opportunities, urbanization, poor land use planning etc.). Along comes a natural hazard such as a significant flood, and the community settled in the flood-line is exposed to the point of experiencing a disaster. However, this should not be

seen as a natural disaster. Although a natural hazard was the trigger for the disaster, it was in fact human-made. If proper settlement planning, land use planning, building codes, community awareness, economic policies, and the like had been in place, then this “natural disaster” would have been mitigated. Almost all exposure to natural hazards and vulnerability can be reduced. Thus, human actions lead to natural hazards becoming natural disasters. One should be mindful that we as humans do not have absolute capacity and have sustained and will sustain significant losses due to natural hazards in future. We however need to realize that we also have capacity to make the right decisions, implement the right measures, and engage in intelligent development planning which will reduce the risk of disasters occurring. The reduction of a risk manifesting in a disaster therefore requires a very broad multi-sectoral and multidisciplinary focus where the structural engineer, politician, social worker, agricultural extension worker and even kindergarten teacher all have equally important

➤ Risk and disaster risk

Risk has various connotations within different disciplines. In general, risk is defined as “the combination of the probability of an event and its negative consequences” (UNISDR, 2009). The term risk is thus multidisciplinary and is used in a variety of contexts. Risk is usually associated with the degree to which humans cannot cope (lack of capacity) with a particular situation (e.g. natural hazard).

The term disaster risk therefore refers to the potential (not actual and realized) disaster losses, in lives, health status, livelihoods, assets and services, which could occur in a particular community or society over some specified future time period. Disaster risk is the product of the possible damage caused by a hazard due to the vulnerability within a community. It should be noted that the effect of a hazard (of a particular magnitude) would affect communities differently (Von Kotze, 1999:35). This is true because of the level of the coping mechanisms within that particular community. Poorer communities are therefore more at risk than communities that do have the capacity to cope.

*To determine disaster risk, three aspects need to be present: **hazard, vulnerability to the hazard and some form of coping capacity.*** These terms will now enjoy greater attention.

Hazard

A hazard is defined as “a dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage” (UNISDR, 2009). Hazards can be single, sequential or combined in their origin and effects. Each hazard is characterized by its location,

intensity, probability and likely frequency. Typical examples of hazards can be the absence of rain (leading to drought) or the abundance thereof (leading to flooding). Chemical manufacturing plants near settlements can also be regarded as hazardous; similarly, incorrect agricultural techniques will in the long run lead to possible disasters. Hazards can either be a creation of humans (anthropogenic) or the environment (natural). Although the former can more easily be planned for than the latter, in both cases the management of the hazard will remain the same.



Vulnerability



easy affected, considered as weak

Vulnerability is defined as the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard. It can be expressed as the degree of loss resulting from a potentially damaging phenomenon or hazard. It is therefore the extent to which a community will degrade when subjected to a specified set of hazardous conditions.

Vulnerability has some distinct underlying causes. The magnitude of each disaster, measured in deaths, damage, or costs (for a given developing country) increases with the increased marginalization of the population. This can be caused by a high birth rate, problems of land tenure and economic opportunity, and the misallocation of resources to meet the basic human needs of an expanding population. As the population increases, the best land in both rural and urban areas is taken up, and those seeking land for farming or housing are forced to accept inadequate land. This offers less productivity and a smaller measure of physical or economic safety, thus rendering the community vulnerable.

Coping capacity



whatever happens, the person seems to be able to cope with the situations they are in.

Coping capacity for disaster risk reduction refers to the ability of people, organizations and systems, using available skills and resources, to face and manage adverse conditions such as hazards, emergencies or disasters. Coping capacities contribute to the reduction of disaster risks.

Resilience

The UNISDR defines resilience as “the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of

a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions” (UNISDR, 2009).

Resilience therefore means the ability to “spring back from” a shock. The resilience of a community in respect of potential hazard events is determined by the degree to which the community has the necessary resources and is capable of organizing itself both prior to and during times of need (UNISDR, 2009).

Emergency and disaster management

According to UNISDR (2009), this involves the organization and management of resources and responsibilities for addressing all aspects of emergencies, in particular preparedness, response and initial recovery steps. An emergency is a threatening condition which requires urgent action. Effective emergency action can avoid the escalation of an event into a disaster. It involves plans and institutional arrangements to engage and guide the efforts of government, non-government, voluntary and private agencies in comprehensive and coordinated ways to respond to the entire spectrum of emergency need.

The expression “disaster management” is sometimes used instead of emergency management.

➤ **Disaster risk reduction**

Disaster risk reduction (also referred to as just disaster reduction) is defined as the concept and practice of reducing disaster risks through systematic efforts to analyze and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse effects. Disaster reduction strategies include, primarily, vulnerability and risk assessment, as well as a number of institutional capacities and operational abilities. The assessment of the vulnerability of critical facilities, social and economic infrastructure, the use of effective early warning systems, and the application of many different types of scientific, technical, and other skilled abilities are essential features of disaster risk reduction.



➤ **Disaster risk management**

Disaster risk management is the systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies,

policies and improved coping capacities in order to lessen the adverse impacts of hazards and their possibility of disaster. Disaster risk management aims to avoid, lessen or transfer the adverse effects of hazards through activities and measures for prevention, mitigation and preparedness (UNISDR, 2009).

The interaction between disaster risk reduction and disaster risk management is clear. Disaster risk reduction concerns activities more focused on a strategic level of management, whereas disaster risk management is the tactical and operational implementation of disaster risk reduction.

The Philippines takes a responsive and proactive stance involving disasters by combining disaster risk reduction and disaster risk management. Republic Act No. 10121 or the Philippine Disaster Risk Reduction and Management Act is a testament to the country's commitment in putting emphasis on strengthening people's capacity to absorb stress, maintain basic functions during a disaster and bounce back better from disasters. The DRRM Act institutionalizes the best practices of local communities which have been implementing effective DRMM in their respective areas.

INTERACTION OF HAZARDS, VULNERABILITY AND DISASTER RISK

In the previous section you were able to develop an understanding of core concepts which included the terms hazard, vulnerability and disaster risk. In this section we will examine how the interaction between hazards and vulnerability translate into disaster risk. In the process, we will identify the political, economic, physical, social, and ecological factors that interact to increase the susceptibility of individuals, households and communities to the impact of hazards. The identification of these factors provides the basis for the prioritization of initiatives which will contribute to reducing vulnerability and thus to eliminating and/or reducing disaster risk. The initiatives so prioritized should then be integrated by the various spheres of government into sustainable development and disaster risk reduction planning. Disaster risk reduction is only valuable once one understands the contexts in which people live, the changing environment in which they find themselves, the impact of this environment on their ability to sustain their livelihoods and the presence of a number of natural forces (natural hazards).

Hazards in themselves do not constitute disasters. The magnitude of a disaster is usually described in terms of the adverse effects which a hazard has had on lives, property and infrastructure; environmental damage; and the costs attached to post-disaster recovery and rehabilitation. In other words, there is a direct link between the capacity of those affected to withstand, cope and recover from the adverse effects of a hazard using only their own resources, and what constitutes disaster risk. Put simply disaster risk is the product of the combination of three elements – vulnerability, coping capacity and hazard (UNISDR 2002:41).

The following notation illustrates this interaction:

$$\text{Disaster risk (R)} = \frac{\text{Vulnerability (V)} \times \text{Hazard (H)}}{\text{Capacity (C)}}$$

OR

$$\text{Disaster risk} = \text{function of H and V/C}$$

It is common cause that in countries where the majority of the population have been marginalized the adverse effects of hazards are of far greater magnitude. The interaction of political, physical, social, economic and environmental conditions which are linked to the marginalized state of those communities translates into extremely unsafe and fragile conditions thus rendering them most vulnerable to the impact of hazards.

Vulnerability is the key element in the link between hazards and what constitutes disaster risk.

To understand disaster risk one needs to find answers to the following questions:

- *Where do people live?*
- *Why do people live there?*
- *How do they make a living?*
- *What is important for them to protect?*

Understanding and finding answers to these four basic questions goes a long way in making sense of the disaster risk which exists within various systems. Human beings are complex and sometimes culture, beliefs, political orientation, link to nature and the environment, economic well-being, and even social networks, have a profound impact on how people perceive the disaster risks which they face. Any perception of a phenomenon can be directly linked to the actions associated with it. Thus, if women and men find the economic benefit of living in a flood line more advantageous than the risk associated with placing themselves in harm's way, then people will not necessarily nor voluntarily take corrective actions to mitigate the disaster risk.

The succeeding section will further pursue the idea of vulnerability and will provide explanations of the various factors which increase or decrease vulnerability and capacity.

UNDERSTANDING VULNERABILITY

The UNISDR (2002) illustrates the common consensus among disaster risk scholars on the factors which compound or alleviate vulnerability.

Political factors. The level of vulnerability in any community can be directly linked to the political will and commitment to developmental concerns. Vulnerability is as much about the exposure to a given hazard as the decision-making linked to development which will address conditions of vulnerability. A set of deep-rooted socio-economic elements which include aspects such as denial of human rights, denial of access to power structures, access to quality education, employment opportunities, land tenure, availability of and access to resources, access to infrastructure, basic services and information, together have the ability to create and maintain extreme levels of vulnerability. Political will is fundamental to disaster risk reduction.

Political will depends on political leadership and a shifting of incentives, pressures and polemics.

Economic factors. Whilst a wide range of factors combine to contribute to levels of vulnerability to the impact of hazards in developing countries, poverty probably has the single most important influence. The eradication of poverty therefore is crucial to vulnerability reduction. The economic status of the population relates not only to the degree of losses in terms of lives, property and infrastructure but also to the capacity to cope with and recover from adverse effects.

It remains imperative for every sector in each sphere of government to prioritize poverty eradication and the creation of sustainable livelihoods in all disaster risk reduction and development planning.

Physical factors. Physical vulnerability refers to the susceptibility of individuals, households and communities to loss due to the physical environment in which they find themselves (refer back to the question on: "Where do people live?"). It relates to aspects such as access to suitable land, land use planning, housing design, building standards, materials used for building houses, engineering, accessibility to emergency services and other similar aspects. Physical vulnerability may be determined by aspects such as population density levels, remoteness of a settlement, the site, design and materials used for critical infrastructure and for housing.

Housing structures are built with improvised materials which are flimsy and highly flammable. Structures have poor, if any, foundations and are built in close proximity to each other. This poor physical environment exposes people to hazards such as landslides, floods, fires, wind, disease and epidemics. In addition, poor planning and the proximity of structures limit access by emergency services in the event of an emergency or disaster. Physical vulnerability also relates to remotely located settlements, their location, the design of building structures, and their ability to

withstand the elements and hazards, as well as their lack of access to services, infrastructure and information.

Social factors. The level of social well-being of individuals, households and communities directly impacts on their level of vulnerability to hazards. Levels of education, literacy and training, safety and security, access to basic human rights, social equity, information and awareness, strong cultural beliefs and traditional values, morality, good governance and a well-organized cohesive civil society, all contribute to social well-being with physical, mental and psychological health being critical aspects. Vulnerability is not equally distributed. Minority groups, the aged, orphans, nursing mothers and their offspring, and the disabled are more vulnerable than others. The issue of gender and in particular, the role of women requires special consideration. A lack of awareness and access to information can also result in increased levels of vulnerability. Disasters can happen because people vulnerable to them simply do not know how to heed early warnings and to get out of harm's way or to take protective measures.

Environmental factors. The discussion of environmental aspects of vulnerability covers a very broad range of issues in the interacting social, economic and ecological aspects of sustainable development relating to disaster risk reduction. The key aspects of environmental vulnerability can be summarized by the following five distinctions:

- The extent of natural resource depletion;
- The state of resource degradation;
- Loss of resilience of the ecological systems;
- Loss of biodiversity; and
- Exposure to toxic and hazardous pollutants).

Many disasters are either caused or exacerbated by environmental degradation. Deforestation leads to rapid rain run-off, which contributes to flooding. The creation of drought conditions and the relative severity and length of time the drought lasts are mainly natural phenomena.

Drought conditions may be exacerbated by:

- poor cropping patterns;
- overgrazing;
- the stripping of topsoil;
- poor conservation techniques;
- depletion of both the surface and subsurface water supply; and

- unchecked urbanization.

The progression of vulnerability and safety

First published in 1994 by Blaikie et al.(1994) and then again by Wisner et a in 2004, the Disaster Pressure and Release Model (PAR) has become the internationally accepted model for the explanation of the progression of vulnerability and the progression to safety (risk reduction).

The **Pressure Model** indicates that there are certain underlying causes, dynamic pressures and unsafe conditions which contribute to vulnerability. Linking the above to a hazardous trigger event, increases the risk in communities.

Vulnerability is depicted in the model as the progression of three stages:

1. Underlying causes: a deep-rooted set of factors within a society that together form and maintain vulnerability.
2. Dynamic pressures: a translating process that channels the effects of a negative cause into unsafe conditions; this process may be due to a lack of basic services or provision or it may result from a series of macro-forces.
3. Unsafe conditions: the vulnerable context where women and men and property are exposed to the risk of disaster; the fragile physical environment is one element; other factors include an unstable economy and low-income levels.

The Pressure Model shows that the progression of vulnerability plays an integral part in understanding community vulnerability and why communities are susceptible to disaster risks. From the model it is therefore clear that the main focus in reducing risks in communities is to address a significant number of development and socio-political issues. This correlates with our earlier discussion of the different domains of vulnerability. The pressure through the progression of vulnerability needs to be reversed.

The Pressure Release Model explains reversing the risk pressure created by the aspects mentioned above in order to create safe communities. In order to reduce the risk of communities in accordance with the Pressure Model one needs to engage in certain risk reduction activities.

Types of hazards

Slow onset hazards

Slow onset hazards are *the easiest to predict and plan for, but can have the biggest environmental impact*. This type of hazard is normally preceded by a number

of early signs or indicators. Interestingly enough, early warning signs often tend to be ignored until it is too late to take any risk reduction or preventive action.

Rapid or sudden onset hazards

In assessing disaster risk, the impact of a given hazard - be it either natural or technological or be it environmental degradation - will depend on the following: the probability of its occurrence; its intensity and characteristics; the susceptibility of the elements at risk based on the political, physical, social, economic and environmental conditions prevailing; and the capacity of the affected individual, household and community to cope, withstand and recover from the impact of the hazard.

Type of Hazards	Slow Onset Hazards	Rapid or Sudden Onset Hazards
Definition/Description	<i>The hazards are the easiest to predict and plan for, but can have the biggest environmental impact.</i> This type of hazard is normally preceded by a number of early signs or indicators	<i>They strike without any or very little prior warning.</i> Despite these hazards being mostly unpredictable, proper planning and preparedness can mitigate the effects of such disasters.
Examples	Droughts, landslides due to heavy rains, environmental degradation or pollution, deforestation desertification and tropical cyclones	wild fires, floods and flash floods, volcanic eruptions, tsunamis (tidal waves), and pest infestations.

DISASTERS AND DEVELOPMENT

With the frequent occurrence of disasters, governments and non-governmental organizations (NGOs) are assessing development projects in the context of disaster risk reduction and are designing disaster recovery program with long-term development needs in mind. To be successful, disaster reduction relies on being built into existing and ongoing development projects at every stage of the project management process, vis-à-vis: needs identification, project definition and planning, development of alternatives, implementation and monitoring.

For a long time, development programs were not assessed in the context of disaster risk or disasters, nor the effect of a possible disaster on the development project, nor whether the development projects increased either the likelihood of a disaster, or increased the potential damaging effects of a disaster.

Without adequate disaster risk reduction planning as part of development projects (in the form of integrating disaster risk knowledge and development planning), the results can be catastrophic. It is therefore essential to develop a mind-set of longterm thinking for all actors involved in development programs including government, professionals (engineers, architects, surveyors, town planners, and agricultural extension workers), legislators, inspectors, builders, councilors, and ultimately the beneficiaries.

Development requires institutional and structural transformations of societies to speed up economic growth, reduce levels of inequality and eradicate absolute poverty. Over time, the effects of disasters can seriously degrade a country's longterm potential for sustained development and cause governments to substantially modify their economic development priorities and programs.

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