Definitions of Comprehensive Examinations: Breadth

(Approved)

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Comprehensive Exam Definitions: Breadth

To develop a holistic conceptual framework for my research, my breadth reading covers a number of academic paradigms and policy guides concerning disaster, with respect to a broad view where modern disasters are complex and diverse phenomena. Among them, the most recognized paradigms are disaster-resistant communities, disaster-resilient communities and sustainable development and sustainable hazard mitigation. Regarding the importance of vulnerability in the disaster equation, my review also covers recent approaches: invulnerable development and comprehensive vulnerability management. Due to the current realization of climate change, I further review the concept of adaptation to climate change. Finally, since my project fundamentally emphasizes the roles of people and local communities as active agents in the integration of disaster reduction, development and climate change, the concept of self-determination and the concept of risk perception and risk communication are also included in this breadth reading.

To comprehensively understand all the above concepts, I begin with an overview of the links among disaster risk reduction, development and climate change, and the historical perspectives of disaster.

The linkages of three realms of action:
Disaster risk reduction, development and climate change

There can be no denial that all around us the environment is changing. The physical environment and availability of resources are being affected by global environmental change, which in turn is being driven by human development and growth. Climate change resulting from rising greenhouse gas emissions is expected to lead to increasing temperatures and changing rainfall patterns over the next century, that will, among other things, significantly affect human livelihoods. Factors like changes in climate also affect changes in the frequency and magnitude of hazards which have triggered disasters (UNDP, 2002). Nevertheless, vulnerability to these hazards is also increasing due to rising poverty, a growing global population, armed conflict and underlying development issues.

This is affirmed by various studies which show a close correlation between increased demographic pressure, growing environmental degradation, increased human vulnerability and the intensity of the impact of disasters (SEI, IUCN, IISD, 2001; UNDP, 2004; UN/ISDR, 2003; UN/ISDR, 2004; World Bank, 2001; World Bank, 2004). Some studies strongly conclude that disasters triggered by natural hazards are a consequence of development failure as much as failed development is the product of disasters (DFID, 2004; UNDP, 2003; Wisner, 2003). For example, Wisner (2003) states that development has increased people's exposure to hazard via the creation of unsafe urban hill slopes, coastal fringes or other marginal areas. He also points out that privatization; public sector retrenchment and liberalization have pushed many people into poverty and, simultaneously, to disaster. Efforts to reduce risk can also backfire. This is most often the case with relocation schemes, where livelihoods and social networks are disrupted (DFID, 2004).

Regarding climate change, Schipper and Pelling (2006) state that in such cycles of resource degradation and poverty, affecting both human well-being and the environment, "climate change and natural hazards play significant roles, just as the state of development influences their ramifications for society and the environment" (p.19). Whereas disasters are understood to hold back development through loss of infrastructure, livelihoods and psychological stress, climate change is frequently cited as one of the most serious environmental problems confronting human development (UNDP, 2002).

The impacts of climate change on development are expected to become manifest primarily through impacts on natural resources, on which the poor depend heavily, and on human health. For example, Molden and de Fraiture (2004) find that temporal and spatial changes in rainfall patterns and shifts in temperatures compound existing crises facing the water and agriculture sectors due to growing populations. Given another aspect, climate change affects disaster risk in two ways: short-time climate variability and its extremes influence the range and frequency of shocks for which society absorbs or adjusts, whereas longer-term variability can lead to changes in the productive base of society, particularly in natural resource dependent economies (Parry & Carter, 1985). In accordance with this recognition, international communities have seen the role of disaster risk management as a response to future

climate change. For example, international commitment to reducing disaster risk was confirmed by the "Hyogo Framework for Action 2005 – 5", which mentions climate change. However, the question to ask is: how can disaster risk be reduced in order to reduce the long-term risk of climate change? While it has been noted that current responses to disaster will no longer be sufficient in a changed climate, where dynamics and mean climate have shifted (Sperling & Szekely, 2005), it must also be stressed that these current responses to disasters are not sufficient, as there are considerable losses that have short- and long-term effects.

Accordingly, a number of scholars have recently called for serious consideration regarding the linkages of these three realms and for developing a theoretical framework as well as policy guide in order to ensure that these three realms of action are undertaken in an integrated manner, thereby finally ensuring a move towards a path of integrated and more sustainable development (Schipper & Pelling, 2006). In building a conceptual framework, we should be aware that while climate change is contributing to raising disaster risk, measures to mitigate the risk need to focus on reducing vulnerability in the context of development efforts.

Historical perspective of disaster

"What is a disaster?" This is perhaps the most important and fundamental question facing disaster study. Quarantelli (1995) notes the significance of what scholars need for clarifying and obtaining minimum consensus on the defining features, including characteristics, conditions and consequences of disasters. This inquiry about disaster is not limited to the academic realm, but finding a resolution to this puzzle also has a dramatic impact upon practitioners' efforts to reduce catastrophic events.

Indeed, the idea of disaster has undergone a dramatic transformation of meaning over time. In the past, many of the cultures around the world viewed disasters as acts of God (Drabek, 1991). This perspective ignores the natural processes of an ever-changing environment. Along with viewing disasters as unpredictable phenomena, the injury, death, destruction and disruption associated with catastrophic events are often regarded to be punishments that fulfilled the divine, and sometimes unknown, purposes of a supernatural being. Later, as the scientific understanding of the earth's

physical systems expanded, disasters became equated with such kinds of hazards as earthquakes, tornadoes, flooding and the like (Cannon, 1994). This natural hazards perspective downplays the role of humans in creating or contributing to all types of catastrophic events (Hewitt, 1983). Although, at that time, research on disasters was dominated by physical scientists and engineers, other disciplinary approaches started studying disaster with an emphasis on different aspects relations to their academic orientation. Accordingly, there have been two conventional views of disaster separately working in disaster study. While most works emphasize the trigger role of geo-tectonics, climate or biological factors arising in nature, others focus on the human response, psychosocial and physical trauma, economic, legal and political consequences (Wisner, Blaikie, Cannon, and Davis, 2004).

However, recent experiences and researches argue that the increasingly costly and complex natural disasters of the last two decades are in large part the result of trying to cope with hazards in isolation from the broader social, economic, environmental, psychological, and political factors that shape our world (Quarantelli, 1998). One of the most recognized arguments is in Mileti's (1999) *Disasters by Design,* where Mileti points out that the old view of disaster, as isolated and emphasizing only technological capability to control nature, gave rise to policies, programs, and activities that actually fostered risk-taking, subsidized hazardous development, took an adversarial stance toward the natural environment, and adopted a narrow, short-sighted view of the world. Consequently, researchers have called for a broader view of disaster and an interdisciplinary approach to developing a more appropriate academic concept and holistic policy guide (Britton & Clarke, 2000; Geis, 2000; Mileti, 1999; McEntire, 1998).

Currently, the field of disaster has moved in many respects towards an alternative explanation that explores the social construction of disasters. This alternative approach does not deny the significance of natural hazards as trigger events, but puts the main emphasis on the various ways in which social systems operate to generate disasters by making people vulnerable. Along with this moving, vulnerability and risk not only are much more emphasized but also are alternatively defined within a much broader framework. For a holistic explanation of disaster, one of the most helpful

concepts is the “Pressure and Release (PAR)” model offered by Wisner, Blaikie, Cannon, and Davis since 1994.

According to Wisner et al.’s PAR model, a disaster is the intersection of two opposing forces that are “Those processes generating vulnerability on one side, and the natural hazard event (or sometimes a slowly unfolding natural process) on the other” (Wisner, 2004, p.50). The former force is the causal chain of three primary social links described as a “progression of vulnerability” that create mounting pressure for a disaster starting with root causes, translated into dynamic pressures, and resulting in the creation of unsafe conditions.

With respect to root causes as an interrelated set of widespread and general process within the society and the world economy, one aspect of them is the limited access to power, structures and resources, while another is ideologies involving both political and economic systems. As process and activities transform the effects of root causes into unsafe conditions, dynamic pressures, therefore, include all kinds of capability and opportunity lacking, such as found with local institutions, training, appropriate skill, local investment, press freedom and ethical standards in public life. They also include macro-forces, such as rapid population growth, rapid urbanization, arms expenditure, debt repayment schedules, deforestation, decline in soil production etcetera.

Regarding the “release” aspect in the PAR model, the idea is incorporated to conceptualize the reduction of disaster as such by considering “root causes” and making certain changes, the “dynamic pressures” that were once translated into risk and vulnerability can then be directed toward the creation of safe conditions, resiliency, and sustainable community development.

In accordance with the PAR model, many broad conceptualizations, viewing disaster as social phenomena and putting emphasis on vulnerability and risk within the development context, have brought a new and useful perspective in facilitating the understanding and reduction of disaster. These significant paradigms are discussed in the following sections.

The disaster-resistant community

Geis (2000), the principal proponent of the term "resistance", defines the disaster-resistant community model as a "means to assist communities in minimizing their vulnerability to natural hazards by maximizing the application of the principles and techniques of mitigation to their development and/or redevelopment decision-making process" (p.152). The primary objective of this model is "to provide the direction essential to our core mission of minimizing the growing human and property losses from extreme natural events" (p.151). With the emphasis on more proactive measures, therefore, mitigation activities, such as hazard and vulnerability analyses, pre-zoning methods, land-use planning, community education and more stringent building codes and regulations, will be required for community development. Geis (2000) declares that the disaster-resistant community "represents the safest possible community that we have the knowledge to design and build in a natural hazard context" (p.152).

The significant advantage associated with the disaster-resistant community paradigm is that the notion helps in the understanding of how to minimize natural disaster losses. There can be little doubt that measures taken for mitigation will decrease the degree of loss resulting from physical agents. Destructive natural hazards may be impending, but the design, placement and development of a community can alter the effects of such an event. However, the disaster-resistant community paradigm does have some inherent weakness. In reviewing this conceptualization within the comprehensive management framework, McEntire et al. (2002) find a number of limitations in this paradigm. Firstly, the model seems to apply only to extreme hazardous events related to the natural environment. Thus, various triggering agents addressed in comprehensive emergency management (CEM), such as the social, civil and technological triggering agents, as well as each of the functional areas of emergency management, are ignored in this model. Secondly, the involvement of many actors, such as emergency manager, meteorologists, first responders, hazardous materials teams, public health officials and the nonprofit sector are precluded in the model. As a result, the resistance model is rather (or most) applicable to urban planners and engineers than other actors. Lastly, although community location, design and construction are integral to community safety, the disaster-resistant community model downplays the social, cultural, and political variables. Thus, while the term

"resistance" captures many physical variables, it must be associated with another paradigm in order to capture social factors.

The disaster-resilient community

The term "disaster resilience" may be defined in many ways. For instance, some scholars (Mileti 1999; Burby et al, 2000) state that resilience applies to the minimization of losses and damages when a disaster occurs, thereby indicating similarity to the term "resistance." Milleti (1999) also suggests a close relation between resilience and sustainable development and sustainable hazards mitigation. Nevertheless, the literature frequently uses the concept of resilience to imply the ability to recover or bounce back to normalcy after a disaster occurs. For example, Emergency Management Australia defines resiliency as "(a) measure of how quickly a system recovers from failures" (cited in Buckle, Marsh, and Smale, 2000, p.9). Mileti (1999) notes how resilience may reduce the need for large amounts of assistance from outside communities. Recent academic articles (e.g. Almedom, 2005; Landau & Saul, 2004; Omand, 2005) put emphasis on social resilience defined as the capacity of a social entity including a group and community to bounce back or respond positively to adversity.

Extending the concept, Kimhi and Shamai (2004) argue that resilience should be understood as having properties comprising aspects of how people respond to disasters: 1) resistance measured by the degree of disruption that can be accommodated without the community undergoing long-term change; 2) recovery measured by the time taken for a community to recover from a disruption; and 3) creativity seen from not just returning to an initial equilibrium point but rather by adapting to new circumstances and learning from the disaster experience. A community that is highly resilient has the capacity to demonstrate each of these properties. Aguirre (2006) also sees resilience as encompassing all three of these components. He stresses that in an ongoing process, a resilient community predicts and anticipates disasters; absorbs, responds and recovers from the shock; and improvises and innovates in response to disasters. In addition, the exploration of the literature by Paton, Smith, and Violanti (2000) indicates that human resilience comprises three components that are dispositional, cognitive, and environmental

(p.175). These features relate to economic, emotional, and cultural aspects of recovery respectively.

Finding that the disaster-resilient community is commonly related to social factors pertaining to recovery, McEntire et al. (2002) point out the high probability that "the term 'resilience' emerged as a reaction or alternative to the term 'resistance'; scholars may have developed this notion to capture social and other variables that had been neglected in previous studies" (p.269). Furthermore, the most common use of the term "resilience" does not assume that disaster prevention is always possible, as does the disaster-resistant community concept. It thus suggests the need for recovery efforts. However, McEntire et al. argue that "proponents of the concept are generally concerned about how fast a society can return to normal, thus making the paradigm somewhat reactive" (p.270). Another limitation, resilience, like resistance, is applied to natural hazards and may have an unclear relation to technological and civil disasters.

Sustainable development and sustainable hazards mitigation

Sustainable development has evolved since it was first introduced as a concept, and it has been used in a variety of different ways by diverse disciplines. However, two definitions are prevalent in the disaster literature. Many scholars refer back to the conceptualization provided by the World Commission on Environment and Development (1987, p. 43): "sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Because this definition is not explicitly related to disasters, attention increasingly is being given to Mileti's sustainable hazards mitigation perspective. Mileti (1999) declares that sustainability implies that "a locality can tolerate and overcome – damage, diminished productivity, and reduced quality of life from an extreme event without significant outside assistance" (p.4). According to Mileti's definition, we should note that sustainable hazards mitigation may have a close relation to the disaster-resilience concept.

In disaster studies, the most important work on sustainability is credited to Denis Mileti and his associates at the Natural Hazards Research and Applications

Information Center at the University of Colorado. Mileti (1999) proposes a new way of thinking about natural hazards that would recognize the complex interface between earth and social systems, as well as the interactions between local activity and globalization; accept responsibility for hazards and disasters; anticipate the uncertain and unexpected; reject short-term thinking; understand more fully the impact for social forces on the occurrence of disasters; and embrace the principles of sustainable development (p.26-30).

To achieve sustainable hazards mitigation, Mileti (1999) recommends the essential five tools including better land-use planning and management to limit settlement in dangerous areas, the enforcement of building codes and standards to protect people and property, increased reliance on insurance to cover possible financial losses from disaster, enhanced early warning systems and improved engineering for buildings and infrastructure to minimize death and damage associated with disaster (p.155-207). His numerous recommendations for the stakeholders in disaster reduction also involve building consensus on a common agenda for disaster reduction, participation in networks and allowing for flexibility in organization, developing tools for improved decision making, measuring progress to determine the need for future adjustments, consolidating knowledge about hazards and putting it into practice. Regarding the macro perspective, this paradigm suggests the need to establish holistic government policies for disasters and development, to improve local and regional responsibility and capability, to exchange knowledge about disasters with other nations, and to determine the condition of hazard to the nation.

In sum, there are numerous benefits that sustainable development and sustainable hazards mitigation provide for disaster studies and disaster reduction. First, sustainability notes the importance of “process” for disaster reduction. Second, the sustainability concept adds to the understanding of the complex relation between development and disasters and indicates that better development practices are needed to prevent disasters. Sustainable development also promotes the understanding of how disaster assistance and recovery may retard development or reduce the probability of future disasters. Another benefit of the sustainability concept is that it incorporates many variables for disaster reduction. It indicates how culture, economics and environment play a role in calamity.

However, McEntire et al. (2002) argue that while the sustainable development and sustainable hazards mitigation paradigm provides "a larger picture of the problems and solutions to disaster than has been offered heretofore", it is not holistic yet (p.271). According to their examination, the limited applicability of sustainability to all disciplines associated with disasters study still exists. While there can be little doubt of the pertinence of sustainability to extreme natural events and some types of technological triggering agents, there is less evidence that it is related to other categories of mass emergencies and disasters. Sustainable development may be more relevant to certain functional areas of disaster (mainly mitigation and recovery) than others. Even when Mileti (1999) tries to link sustainability to preparedness and response, he is aware of the uncertain fit: "warning systems seem to have little direct bearing on sustainable development" (p.197).

With the integration of sustainable development concept to disaster, here, we should note the significant perspective that natural hazards should not be considered as a subset of sustainable development problems, but should be viewed as they often (but not always) overlap with sustainable development problems. Berke (1995) notes that "the knowledge gained by [disaster] researches and the extensive experience of [disaster] practitioners needs to be meaningfully introduced into the sustainable development debate, otherwise, naïve assumptions about sustainable development eliminating [disaster] impacts could lead to the shaping of flawed policy" (p.14).

Invulnerable development

While the above paradigms provide many advantages for disaster scholarship and management, they fail to sufficiently address the triggering agents, functional areas, actors, variables, and disciplines pertaining to calamitous events (McEntire, Fuller, Johnston, and Weber, 2002). According to this realization and the importance of vulnerability in the disaster debate, the concept of "invulnerable development" was recently proposed as a possible paradigm and policy guide for the future of emergency management. According to this concept, vulnerability is defined broadly as a high level of risk and susceptibility, coupled with a low degree of resistance and resilience (McEntire, 2001, p.190). According to McEntire (2000) who initially

worked on this concept, invulnerable development is defined as development pursued in such a manner as to address vulnerabilities. McEntire states that invulnerable development is a process whereby decisions and activities are intentionally designed and implemented to take into account and eliminate, to the fullest extent possible, disaster vulnerabilities. The term "invulnerable" suggests efforts to reduce liabilities from the physical, social and organizational environments, while "development" evokes the building of capacity in these areas as well. In other words, invulnerable development is viewed by McEntire as a process that attempts to decrease the quantity (or frequency) and quality (or severity) of emergencies and disasters through liability reduction and capacity building. As a means to pursuing these goals, the invulnerable development concept implies: 1) the linking development practices to vulnerability reduction; 2) the altering of cultural attitudes about disasters (culture of safety, prevention and preparedness); and 3) the building of emergency management institutions (increasing the capacities, cooperation, coordination and effectiveness of community, public, private and non-profit sectors) (McEntire, 2001, p.193).

Here we should highlight several strengths associated with the invulnerable development concept. First, this approach truly shifts disaster paradigms from hazards-based to vulnerability-based. This is more likely to amount to a revolutionary approach in that "humans are able to manage their vulnerability but have little control over natural hazards" (McEntire et al., 2002, p.273). Second, with respect to the need for a more holistic perspective on the disaster problems, invulnerable development incorporates the vast majority of triggering agents, functional area, actors, variables and disciplines related to disasters. Third, invulnerable development acknowledges that vulnerability has a unique relation to both disasters and development. For example, development may increase or decrease vulnerability to disasters, while disasters may set back development or provide new opportunities for progress which may subsequently increase or decrease vulnerability to future disasters (UNDP, 1992; Quarantelli, 1994; Mileti, 1999). Finally, invulnerable development integrates and synthesizes prior approaches with current concerns to build a more holistic theoretical orientation.

However, a possible defect associated with the invulnerability development concept can be noted in that even though McEntire (2001) has been careful to stress that

invulnerability development refers to a process rather than a state or condition, the concept may be interpreted as implying a situation where there are no disasters. In addition, some scholars address the definitional problem of the term "development" as being also a significant weakness of the invulnerable development concept (McEntire et al., 2002).

Comprehensive vulnerability management

Integrated with comprehensive emergency management framework, McEntire et al. (2002) alter invulnerable development by giving it the name "comprehensive vulnerability management", defined as holistic and integrated activities directed toward the reduction of emergencies and disasters by diminishing risk and susceptibility and building of resistance and resilience. This concept retains an emphasis on vulnerability, which shows a clear relation to the vast majority of triggering agents, functional areas, actors, variables and disciplines related to disasters.

Comprehensive vulnerability management, a vulnerability-oriented approach, views the vulnerabilities of one triggering agent as not being isolated, rather it interacts with those of another: "there are many unique combinations of vulnerability, which have an impact on all types of disasters" (McEntire et al., 2002, p.274). Therefore, an all hazards approach is significant in comprehensive vulnerability management, yet definitely with an emphasis on vulnerability aspects. Comprehensive vulnerability management takes into account the wide array of disaster-inducing or disaster-intensifying variables: "various forms of vulnerability must be addressed if disasters are to be minimized in quantitative and qualitative terms" (p.275). The various forms of vulnerability can, however, be places under physical, social, cultural, political, economic, technological and developmental categories.

Moreover, on the basis that all efforts to decrease emergencies and disasters must be a process working through liabilities reduction and capacities building, comprehensive vulnerability management is, therefore, related to each of the four functional areas of emergency management: mitigation, preparedness, response and recovery. Instead of considering them as separate phases of emergency management, comprehensive

vulnerability management emphasizes their interrelation which impacts the effectiveness or even becomes, constrains of each other. In addition, the failure to perform effectively emergency operations functions increases the inability of people to cope with disasters that can be prevented. Therefore, these four functional areas must be emphasized equally and be linked to each other. For example, comprehensive vulnerability management stresses that recovery actions (reconstruction, relocation and redevelopment) must not only aim for local capacity building, but also link back to mitigation for the reduction of future vulnerabilities.

In addition, comprehensive vulnerability management is related to the vast majority of actors that are (or need to be) involved in disaster reduction. Comprehensive vulnerability management recognizes not only the important roles of such sectors as public, private and nonprofit, but also the citizen's role in the reduction of vulnerability, as McEntire et al. (2002) state "the activities of the public, private, and nonprofit sectors will always be incomplete unless individuals take vulnerability into consideration" (p.275).

In summary, comprehensive vulnerability management suggests the need to investigate the factors that produce risk and susceptibility, the characteristics that promote resistance and resilience, and the complex interactions of liabilities and capabilities.

Adaptation to Climate Change

Climate change is arguably the most persistent threat to global stability in the coming century. The scientific evidence that climate is changing due to greenhouse gas emissions is now incontestable. It is also well accepted that climate change will not only alter the severity, frequency and spatial distribution of climate related hazards, but also will be likely to "result in societal impacts through changes in water, natural resources, food systems, marine ecosystems and through the need to cope with a changing regime of weather extremes" (Adger et al, 2003, p.185). Although the notion of the connection between global climate change and particular climate events becomes increasingly sophisticated, it is still not possible to predict with any degree of confidence how particular climate events in specific locations will behave in the

future (UNDP, 2002). In short, the risks associated with climate change are real but highly uncertain.

With respect to the potential risks and unpredictability generated by climate change, many scholars call for more emphasis on the need to identify and support generic adaptive capacity along-with hazard-specific response capacity (Adger et al, 2003; Fussel & Klein, 2006; Adger, Kelly & Ninh, 2001; Schipper & Pelling, 2006; UNDP, 2002). Fussel & Klein (2006), for instance, mention two fundamental response options to reduce risks posed by climate change: mitigation of climate change and adaptation to climate change. Mitigation refers to limiting global climate change by reducing the emission of greenhouse gases and enhancing their sinks. Adaptation primarily aims at moderating the adverse effects of un-avoided climate change through a wide range of actions that are targeted at the vulnerable system. It may also include taking action to seize new opportunities brought about by climate change.

Fussel & Klein (2006) further state that mitigation has traditionally received much greater attention both from scientific and from policy perspectives, however, there are convincing arguments for a more comprehensive consideration of adaptation as a response measure to climate change. First of all, given the amount of past greenhouse gas emissions and its effects on the climate system, we are already bound to some level of climate change "which can no longer be prevented even by the most ambitious emission reduction" (p.304). In addition, the effect of greenhouse gas emission reduction takes several decades to be fully manifest, whereas most adaptation measures have more immediate benefits, and also reduce the risk associated with current climate variability, which is a significant hazard in many world regions. Finally, whereas mitigation of climate change requires international cooperation, adaptations can be effectively implemented on a local or regional scale because their efforts relate to local context.

Indeed, individuals and societies will adapt and have been adapting to climate change over the course of human history. Much natural resource based development over the centuries has depended on constant adaptation to changing environmental conditions. However, the rapid accumulation of climate related risk in recent decades and the resulting patterns of loss indicate the growing failure of and breakdown of adaptation

and coping (UNDP, 2002). Adger et al. (2003) argue that although all societies are fundamentally adaptive, and there are many situations in the past where societies have adapted to change in climate and to similar risks, some sectors are more sensitive and some groups in society are more vulnerable to these risks than others. Thus, it is necessary to distinguish adaptation by identifying who is undertaking it and the interests of the diverse stakeholders involved. There are various geographic scales and social agents involved in adaptation. Some adaptation is undertaken by individuals in response to climate threats, whereas other adaptation is undertaken by governments on behalf of society, sometimes in anticipation of change. However, these levels of decision-making are not independent but, rather, are embedded in social processes that reflect the relationship between individuals, their networks, capabilities and social capital, and the state (Adger et al., 2001).

According to Fussel & Klein (2006), effective adaptation to climate change is dependent on finding out what to adapt to, how to adapt and the resources to implement the adaptation measures. Therefore, the effective adaptation requires two critical elements: "the collection of information" about the vulnerable system and the stressors to which it is exposed and "the transfer of resources" to vulnerable societies (p.304). Fussel & Klein also identify four different assumptions on adaptive behavior including: "the 'dumb farmer', who does not react to changing climate conditions at all; the 'typical farmer', who adjusts management practices in reaction to persistent climate change only; the 'smart farmer', who uses available information on expected climate conditions to adjust to them proactively; and the 'clairvoyant farmer', who has perfect foresight of future climate conditions and faces no restrictions in implementing adaptation measures" (p.307). According to these different levels of adaptation, the levels of climate change impacts are hypothetically ranged from "potential impacts", assuming no adaptation, to "unavoidable impacts", assuming perfect adaptation.

However, the approach to climate change vulnerability assessments has been recently shifted from estimating expected damages to attempting to reduce them. This shifted approach accounts for important non-climatic factors and acknowledges the potential for adaptation measures to reduce potential climate impacts. Moreover, it pays particular attention to the ability of a system or population to adapt to climate change

(adaptive capacity) with realizing that "it is not the mere availability of adaptation options but the capacity of people to actually implement these options that determines their vulnerability to climate change" (Fussel & Klein, 2006, p.319).

The concept of self-determination

It is simply known that self-determination means people or peoples having control over their lives and destinies. However, its conceptualizing is much more complex and diversified. This paradigm changes the relationships and the threats not only between states but also between a state and its people. With respect to self-determination, the process of decision making is shifted from a top-down approach to a bottom-up approach, which highly respects the person's identity, freedom and needs.

According to the American Heritage Dictionary of the English Language (1992), the term self-determination has two differently emphasized meanings as: first, "determination of one's own fate or course of action without compulsion" and second, "freedom of the people of a given area to determine their own political status; independence," (cited in Wehmeyer, 1998, p.5). The first meaning, primarily conceptualized in the field of personality psychology, behavior science and education, is one of a personal self-determination; controlling one's life and one's fate. The second meaning, developed in the field of political science and international law, refers to a political, national or collective self-determination; recognizing the right of a nation or a group of people to self-governance. It must be noted here that a group of people is defined by criteria other than geographic boundaries, including people self-identified by cultural or racial characteristics, sexual orientation, gender or disability status (Archibugi, 2003; Glennon, 2003; Wehmeyer, 1998; Xanthaki, 2005). In accordance with these two main meanings, there are several conceptualizations associated with self-determination.

Political, national or collective self-determination has been largely conceptualized as a right, an ideal or principle. As a principle, self-determination runs through various human rights in their collective capacity; as a right, it revolves essentially around political power, participation and control (Xanthaki, 2005). As regards the area of

international law, self-determination did not emerge as a principle of international law until the end of World War II, when it was proclaimed in the United Nations Charter (Article 1.2, p.55 and p.73). However, the Declaration against Colonialism (1960) was the first instrument that tried to clarify the content of self-determination recognized as the right of peoples to "freely determine their political status and freely pursue their economic, social and political development" (cited in Xanthaki, 2005, p.16).

According to the review on "The Right to Self-determination: Meaning and Scope" done by Xanthaki (2005), there has been an evaluation of self-determination conceptualization that has spun into three categories, each with a different emphasis. The first is the self-determination of colonial people, which is how the term is used in the United Nations Charter and in many other sources of international law. The second meaning, associated with secession, encompasses the demands of minorities which intend to break away from the state to which they belong, and has been the most prevalent since the end of the Cold War, and is also the one most directly associated with armed conflicts and civil wars of the last decade. The third meaning refers to certain ethnic or cultural groups which, although intending to remain part of the state to which they belong, wish to achieve certain collective rights. This latter meaning is the most innovative conceptualizing self-determination which currently is extended to respect different people's self-identities such as gender, disability status and sexual-orientation.

In short, political, national or collective self-determination currently conceptualizes self-determination as a peoples' right and not a government's right. It relates to freedoms 'a people' can have; it is about giving people the freedom to determine their lives and destinies. In this way, it incorporates political, economic, cultural and social claims of all kinds (Archibugi, 2003; Glennon, 2003).

While political, national or collective self-determination has been largely conceptualized as a right, an ideal or principle, personal self-determination has been conceptualized as an innate drive or internal motivation, a capacity, a process or outcome, or a trait or characteristic of a person or actions (Wehmeyer, 1996). For example, Doll, Sands, Wehmeyer and Palmer (1996) argue that self-determination is

either a process or an outcome. They maintain that there is a process that combines aspects of development, learning, opportunity and experience that lead to a person becoming self-determined, or a process leading to a group of people gaining political self-determination. However, several conceptualizations found by reviewing literature can be classified into three different perspectives on personal self-determination, including psycho-educational perspectives, ecological perspective and socio-political perspective.

The first approach, psycho-educational perspective, is evident in the work of Wehmeyer and colleagues (Wehmeyer et al., 1995; Wehmeyer, 1996; 1998; Wehmeyer & Bolding, 1999). Wehmeyer (1996, p.24) defines self-determination as "acting as the primary causal agent in one's life and making choices and decisions regarding one's quality of life free from undue external influence or interference." The term "causal agent" implies that an outcome was purposeful and the action was performed to achieve that end. A causal agent is someone who makes or causes things to happen in his or her life. Wehmeyer further develops this definition to identify four essential characteristics of self-determined behavior: 1) autonomy, 2) self-regulation, 3) psychological empowerment and 4) self-realization. In addition, there are a number of behavioral components integral to the emergence of the four essential characteristics of self-determination. There is a clear focus on interventions to provide individuals with the skills, attitudes and knowledge that they are seen to need to be self-determined (Wehmeyer et al., 1998). Proponents of the psycho-educational perspective certainly recognize the importance of environmental factors, rights and political self-determination but have tended to place relatively more emphasis on personal self-determination, skill-based intervention, and the four elements of self-determination listed previously.

The second approach, ecological perspective, however, clearly acknowledges the importance of self-determination competencies (skills, attitudes and knowledge) but places strong emphasis on environmental factors that impinge on the real-life exercise of personal control over aspects of one's life. The framework involves both the immediate environments in which the person operates (living, educational, leisure and work environments) and broader societal influences such as regulatory systems, legislation, legal systems and due process (Abery, 1994; Abery & Stancliffe, 1996).

Personal control refers to the absolute levels of control that individuals exercise over what happens in their lives, when and where it occurs, and with whom it takes place (Stancliffe, Abery and Smith, 2000). According to this definition, self-determined individuals may voluntarily cede partial control of some aspect of life to others whom they trust. In doing so they are being self-determined but are exercising less direct personal control in that area.

Differently, a third approach to self-determination defined the socio-political perspective focusing on the perspective of rights and self-governance. In conceptualizing the self-determination of aboriginal people in Canada, for example, Espey (2002) proposes the principle of OCAP (Ownership Control Access Possession) as the fundamental components of self-determination. This principle has been applied in such particular issue as information self-governance. The first principle, ownership, refers to the relationship of a First Nations community to its cultural knowledge, data and information. The principle states that a community or group owns information collectively in the same way that an individual owns his or her personal information. The second principle of "control" asserts that First Nations, their communities and representative bodies are within their rights in seeking to control research and information management processes which impact them. The third principle, access, refers to First Nations people having access to information and data about themselves and their communities, regardless of where these are currently held. It also refers to the right of First Nations communities and organizations to manage and make decisions regarding access to their collective information. The last principle, possession, is a mechanism by which ownership can be asserted and protected. While "ownership" identifies the relationship between a people and their data, the idea of "possession" is more literal.

Another example of conceptualizing self-determination based on socio-political perspective is the work of the National Program Office on Self-determination at the University of New Hampshire, where the program is designed to restructure the U.S. long-term care system by moving a facility-based, highly regulated system to individualized funding arrangements, where people with disabilities and their advocates have control over funding and services. According to this program, self-determination is said to be based on four principles: 1) the freedom to choose, 2)

authority to control, 3) support that is organized in highly individual ways according to the person's desires and needs, and 4) responsibility for the wise use of public funding and for contributing to one's community (Stancliffe, 2001).

Applying self-determination to the context of disaster risk management, people and communities at risk should be recognized as active agents who are able to make appropriate decisions, plan, and act in such areas of risk reduction. Therefore, promoting a self-determination approach in disaster reduction must include both enhancing people's opportunity to employ their collective rights and expanding their participation in the process to determine community risk reduction plan and development (risk assessment, mitigation plan, preparedness, emergency response plan, early warning system etc.). In addition, their views and perceptions of risk definitely need to be acknowledged and to become an essential aspect in all designed programs of risk reduction.

Risk perception and risk communication

There are two main reasons why the concept of risk perception and risk communication becomes very crucial to achieve safe communities. Firstly, as previously mentioned, there is the current call for the integration of three realms of action: disaster reduction, development and climate change. These three working areas all involve risks which communities will face and how they will manage. Therefore, their integration is necessarily oriented to risk perception and risk communication. Secondly, it is accepted that societies need to be proactive in regard to their anticipated risks, rather than simply waiting to react to their effects.

Truly, people at risk do make rational choices about protecting themselves from disaster. They do have a view of that risk and correspondingly respond to hazards and risk in different ways. Some people respond by undertaking mitigating measures, while others ignore the risk. Various studies on risk perception (Cutter 1993; Newton, 1995; Smith, 1996; Stephens, Patnaik and Lewin, 1995) verify that the experience of risk is both one of physical or potential physical harm and the result of the cultural and social process through which individuals or groups interpret hazards differently. Twigg (2003) explains that "individuals have their own 'worldview' or

understanding of how the world works based on a combination of observations, information and ideas" (p.20). Many different worldviews result in many different perspectives of risk, which also vary according to socio-economic differences, such as wealth, social standing, level of education, age, religion, ethnic group and gender (Newton, 1995). For example, the research on risk perceptions among slum dwellers living in flood-prone districts in India, in choosing where to live, demonstrates that the slum dwellers made a rational trade-off between the social and economic benefits of their location and the risk of monsoon floods, but they had also developed sophisticated monitoring and warning routines and had clear priorities for action in response (Twigg, 2003).

In regard to those responsible for ensuring safety to the public, Adler and Kranowitz (2005) state two key challenges. The first is to communicate risks in a manner that acknowledges the emotional content and provides information to assuage concerns. The second is to engage the public so that they become effective partners in addressing and overcoming risks. Communication and engagement are key elements of effective stake-holding. As afore mentioned, different groups can view the same set of issues through different lenses. Working with different stakeholders, therefore, provides different frames of reference and units of analysis to approach the same issue. Rather than a one-size-fits-all approach, listening to and using the language of different stakeholders allows for different approaches to a similar set of issues, yields higher levels of trust and creates longer lasting decisions.

Risk communication, therefore, involves cross-cultural communication between outsiders (disaster professionals) and people at the grass roots level, as well as among different involved agencies. There has been a decided progression in risk communication, starting from just trying to get people to behave 'rationally' by providing them with information, to today's more modern view, that risk communication is a two-way communication that involves exchanging of information, understanding people's perception of the risks and developing solutions in partnership (Fischhoff, 1995; Leiss & Powell, 2004). For instance, Salter (1998) views risk communication as an integral part of risk management that is an interactive process involving the exchange of information and opinion about risk among individuals, groups, and institutions. In accordance with a self-determination approach, Salter

asserts that effective risk communication is a two-way process with participation seen as an individual's and community's democratic right. Similarly, Tarrant (1997), emphasizing the social context of risk perception, states that the concept of risk communication must shift from communication 'for' to communication 'with'. Tarrant also modified this shifting for the new model of 'empowering', which emphasizes a two-way dialogue for enabling the facilitation of understanding and concerns, as well as enabling and empowering community action.

As a result of this shifting, risk communication moves beyond such dominant approach as "public relation" to emphasize, rather, "public involvement". Adler & Kranowitz (2005, p.30) state that "public involvement is a public process that seeks to involve constituents in framing both the problems they anticipate as well as the solutions to those problems." They concisely affirm that it is a dialogue based on the principle of self-determination where people must have the opportunity to participate in decisions that affect them. It is a means by which the public's opportunity is not only heard before a decision, but has "an opportunity to influence the decision from the beginning to the end of the decision-making process" (p.30). Public involvement is, therefore, related to public information which is provided not to convince the public of a predetermined position, but rather to inform, so that people can make a considered judgment.

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