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The Concept of Social Vulnerability: A Review from Disasters Perspectives

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Abstract

Vulnerability is made up of the characteristics of a person or group and their situation that influence their capacity to anticipate, to cope with, resist and recover from the impact of a natural hazard. This research paper is based on the various reviews with special focus on the text of social vulnerability due to natural disasters. Social vulnerability is determined by various factors such as physical, social, economic, and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards. Poverty, occupation, caste, ethnicity, exclusion, marginalization and inequities in material consumption of a society or community also enhance social vulnerability. Some people within the social systems like ethnic minorities, disempowered castes or classes, religious groups, or occupations may live or work in physical areas that are relatively disaster-prone. So to solve the issue of social vulnerability in the long run process there must be interdisciplinary and cross-cultural studies of natural disaster impacts and social vulnerabilities. Social scientists needs to continue to seek practical ways to incorporate local technical knowledge, insight, skills, desires, and needs into the management of disaster situations, so that local people and institutions might be affirmed in identifying problems and offering solutions towards the management of their own situation, and that local capacities may be strengthened to resist future emergencies.

Key Words: Social vulnerability, Poverty, Marginalization, Caste, Ethnicity, Natural Hazard, Disasters

Introduction

Understanding vulnerability requires more than simply understanding societies' past and present relations with regard to disaster and development. Vulnerability is also about people, their perceptions and knowledge. People's ideas about risk and their practices in relation to a disaster constitute the sextant and compass with which they measure and chart the landscape of vulnerability (Hilhorst and Bankoff, 2006: 4). The International Strategy for Disaster Reduction (UN/ISDR: 2004) defines vulnerability as "the conditions determined by physical, social, economic and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards. Whereas in contrast of ISDR, the United National Development Programme (UNDP) defines vulnerability as "a human condition or process resulting from physical, social, economic and environmental factors, which determine the likelihood and scale of damage from the impact of a given hazard (UNDP 2004:11).

Vulnerability may be defined as an internal risk factor of the subject or system that is exposed to a hazard and corresponds to its intrinsic predisposition to be affected, or to be susceptible to damage. In other words, vulnerability represents the physical, economic, political or social susceptibility or predisposition of a community to damage in the case of a destabilizing phenomenon of natural or anthropogenic origin (Cardona 2006: 37). It is fundamentally a political ecological concept which focuses on the relationship that people have with their environment as well as a close attention to the political economic forces characteristic of the society in which they live that shape and condition that relationship. At least from the perspective of hazards and disasters, vulnerability is the conceptual nexus that links the relationship that people have with

their environment to social forces and institutions and the cultural values that sustain or contest them. Thus, combining elements of environment, society and culture in various proportions, the concept of vulnerability provides a theoretical; framework that encompasses the multidimensionality of disasters (Blaikie et al. 1994; Comfort et al. 1999; Cutter 1996; Hewitt 1983b). At the same time Cannon is also of the opinion that vulnerability is a characteristic of individuals and groups of people who inhabit a given natural, social and economic space, within which they are differentiated according to their varying position in society into more or less vulnerable individuals and groups. It is complex characteristic produced by a combination of factors derived especially (but not entirely) from class, gender and ethnicity (1994:19). Whereas in the Hazards-of-Place Model of Vulnerability as shown in fig. 1 of Cutter et al. (2003) vulnerability is identified as a combination of risk of hazardous events both from the context of biophysical as well as social vulnerability.

Research methods

This research paper is based on the review of various studies of social vulnerability due to natural disasters. Some are empirical studies whereas some papers are theoretical and conceptual studies. Based on the secondary data piled up from the various journal articles, books, documents and seminar/ conference proceedings, the concept of social vulnerability is tried to discuss in this research paper.

Conceptualizing Social vulnerability: A Review Analysis

The text of social vulnerability is a by-product of social inequalities. It is defined as the susceptibility of social groups to the impacts of hazards, as well as their resiliency, or ability to adequately recover from them (Cutter and Emrich 2006) and a social dynamic rooted in gender, class, race, culture, nationality, age, and other power relationships (Enarson, Fothergill, and Lori 2006). Social vulnerability is influenced by a variety of factors. Social class is one of the largest contributors to social vulnerability (Burton and Cutter 2008). It includes employment (type and stability), income, savings, and education levels (Zahran et al. 2008; Burton and Cutter 2008; Cutter 2006a; Fothergill and Peek 2004; Dwyer et al. 2004; Lindell and Perry 2004; Cutter et al 2003; Buckle et al 2000; Mileti 1999; Morrow 1999; Bolin and Stanford 1998; Dash, Peacock and Morrow 1997; Blaikie et al. 1994), the quality of human settlements (housing type and construction, infrastructure and lifelines) (Dwyer et al., 2004; Cutter et al. 2003; Bolin Stanford 1998), tenure type (Dwyer et al. 2004; Cutter et al. 2003), built environment, family structure (Cutter et al. 2003; Buckle et al. 2000; Morrow 1999) population growth, commercial and industrial development, medical services, and special needs population (Cutter et al. 2003). This is a central component of vulnerability, particularly in combination with other marginalization factors (Blaikie et al. 1994) and these factors have an influence on economic losses, injuries and fatalities from natural hazards (Cutter et al. 2003). Race and ethnicity also contribute to social vulnerability through a lack of access to resources (based on language, culture, educational levels), the economic marginalization that is often associated with racial and ethnic disparities (Burton and Cutter 2008; Wisner et al. 2004; Cutter et al 2003; Bolin and Stanford 1998) and age (specifically elderly) (Burton and Cutter 2008; Cutter 2006a; Dwyer et al. 2004; Cutter et al. 2003; Buckle et al. 2000; Morrow 1999; Bolin and Stanford 1998; Blaikie et al. 1994) as well as gender (females considered more vulnerable than males) (Burton and Cutter 2008; Dwyer et al. 2004; Wisner et al. 2004; Buckle et al 2000; Mileti 1999; Bolin and Stanford 1998).

According to (Schmidlin et al. 2009) "social vulnerability to natural hazards is the potential for loss and is complex interaction among risk, mitigation, and the social fabric of a place". Cutter et al. (2003) provided generally accepted factors affecting social vulnerability which include:

- Lack of access to resources such as information, knowledge, and technology,
- Limited access to political power and representation,

- Social capital including social networks and connections,
- Beliefs and customs,
- Building stock and age,
- Frail and physically limited individuals, and
- Type and density of infrastructure and lifelines.

Whereas The SoVI was divided into two groups of indicators/indexes by Holand et al. (2011) as Socio-economic Vulnerability Index (SeVI) and the Built Environmental Index (BEVI) in their study of Norway. The SeVI is based on a society's socio-economic status, education levels of residents, employment status, demographic and ethnic composition, gender equality, political activity and housing. And The BEVI is based on vulnerability that is dependent on the built environment in a society such as:

- Distance to nearest hospital (long distances decreases access to this lifeline and increase risk vulnerability)
- Population and housing density (high population density makes evacuation harder and increase risk of losses)
- Age of building stocks (high rate of buildings built before 1980 means higher vulnerability since they are generally built with less strict construction requirement compared to newer buildings)
- Average age of sewers and water pipelines (old water and wastewater management system are more vulnerable to natural hazards and hence are the people depending on them)
- Length of municipal roads (long roads have a higher risk of being damaged during an environmental hazard occurrence)
- Number of exit routes per 1000 habitants (fewer exit routes increases vulnerability due to a more complicated evacuation process) (cf. Lundgren and Jonsson 2012)

The notion of social vulnerability as opposed to the vulnerability of built structures refers to the potential harm to people. It refers to "the characteristics of a person or group in terms of their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard. It involves a combination of factors that determine the degree to which someone's life and livelihood are put at risk by a discrete and identifiable event in nature or in society" (Blaikie et al. 1994). It also results from social inequalities and historic patterns of social relations that manifest as deeply embedded social structural barriers that are resistant to change. Vulnerability is "embedded in complex social relations and processes" (Hilhorst and Bankoff 2006:5) and is best viewed as a social problem that requires social solutions. Doing so requires us to address how complex the problem really is, because it is not just that a hurricane approaches or an earthquake shakes the ground. Rather, the problem stems from an "interface of society and environment" (Oliver-Smith 2002) that is a pre-existing condition (Cutter 1996). Risk is thus socially produced and is not inherent to the hazard, disasters, which result from a misfit between human systems, the built environment, and the physical world, tend to reveal clearly the social problems that make response and recovery difficult at the individual and family levels (Mileti, 1999; Barton, 1969). By recognizing the nature of vulnerability, we can design solutions and reduce consequences. Because power relations underline much of the economic, social, and political segregations that marginalize social groups and increase risk, the solutions also lies in empowering those most vulnerable, in short, a political solution as well as a social solution (Hilhorst and Bankoff, 2006).

The framework of the social vulnerability approach

The social vulnerability approach is not sufficient alone to plan for disasters and must be understood as part of a larger, broader approach that includes understanding geophysical hazards and technological solutions. Vulnerability assessment thus incorporates insights from the physical world but emphasizes the roles of social, economic, and political relations in the

creation of hazardous situations in a specific place. Vulnerability analysis examines the social distribution of risk and why some populations bear disproportionate levels of risk to disasters. Some groups in society are more prone than others to damage, loss, and suffering in the context of differing hazards. Key characteristics of these variations of impact include class, caste, ethnicity, gender, disability, age, or seniority (Blaikie et al., 1994:9). Social vulnerability reflects the “classic political economy problem of the allocation of scarce resources among competing individuals, groups and classes,” that is, the problem of differential vulnerability for people “by virtue of where they live, work, or own property” (Boyce 2000). From the vulnerability perspective, it is necessary to understand both the physical impact of disasters and the social conditions that underline differential outcomes. Blaikie et al. (1994) proposed a conceptual model known as the “Pressure and Release” (shown in Fig 2) model to describe patterns of social vulnerability from socio-economic, political and institutional forces into unsafe physical and social conditions that lead to mortality and morbidity in the event of a natural hazard. This model is based on the idea that an explanation of disaster requires us to trace a progression that connects the impact of a hazard on people through a series of levels of social factors that generate vulnerability. Disaster is conceptualized as a complex interaction of two opposing forces: natural hazards and a vulnerable society. The most important root causes that give rise to vulnerability (and that reproduce vulnerability over time) are economic, demographic, and political processes. These affect the allocation and distribution of resources between different groups of people. But the factors which contribute to social vulnerability in the model (shown in fig 3) of Dwyer et al. (2004:5) includes individual within household, community, geographical and organizational or institutional. Their study focused on the first level of social vulnerability, which relates to the vulnerability of an individual within a household. In this model social vulnerability has been recognized as an element which is integral to understanding the risk to natural hazards and divided into four levels:

- Individual within household (relating to personal attributes)
- Community (relating to how we interact with those around us)
- Regional/Geographical (relating to how far we are from services)
- Administrative/Institutional (relating to disaster funding and mitigation studies)

Their study focuses on only one aspect of social vulnerability i.e. individual and their household (the ability of an individual within a household to recover from a natural hazard impact). Another model (Fig 4) given by Parker et al. (2009) which is shown below describes the structuring of social vulnerability clearly depicting the major characteristics of social vulnerability. In this model social vulnerability is determined by the extent of personal and social capital and the associated attributes are listed in the middle column whereas the third column categorises the elements of social vulnerability into “security factors’, ‘economic factors’ and ‘social factors’.

Approaches to assessing social vulnerability

Wisner (2006: 184-188) analysed four main approaches to assess social vulnerability. Those four approaches are discussed under the themes as given below:

The demographic approach

These approaches continue to follow the former United Nations Disaster Relief Organization (UNDRO) definition (inspired by an engineering approach): ‘the potential for danger or loss’ (Alexander, 2000). These approaches tend to consider human beings as one of many ‘elements’ at risk to varying degrees, given hazards with certain characteristics and an array of elements with differing degrees of potential for damage or loss (hence, structural vulnerability of buildings, bridges, health care systems and people). The social vulnerability of groups of people is generally lost in the analytical shuffle by administrators who seek to minimize the ‘vulnerability’ of systems and things.

The taxonomic approach

This approach focus on the vulnerability of social groups, and is concerned with the causes of this social vulnerability that different groups of human beings often suffer different degrees of death, injury, loss and disruption from the same event, and also experience different degrees of difficulty, success or failure in the process of recovery (Enarson and Morrow, 1997; Hewitt, 1997; Blaikie et al., 1994, Lavell, 1994; Asyan, 1993; Maskrey, 1998). These approaches tend to break vulnerability down into different elements (social, economic, environmental, informational vulnerability, etc.), and they tend to work on the basis of empirically developed taxonomies (for example, the vulnerability of women, children, the elderly, the disabled, ethnic/racial/or religious minorities and illegal immigrants). In a similar way, Lavell (1994: 52-61) distinguishes among four interrelated kinds of vulnerability: economic, social, educational and informational, and environmental, and Cannon (2000: 47) identifies four components of vulnerability’:

- Initial well-being
- Livelihood resilience
- Self-protection
- Societal protection
- Social capital (social cohesion, rivalries, number and strength of potentially conflicting or cooperating people).

The situational approach

The key question of situational approach is not what kind of groups a person or family belongs to, but the nature of their daily life and their actual situation (including the way in which it may have changed recently or may be changing). This approach is based upon a view of disasters that sees them not as ‘exceptional’ events; rather, they are perceived as extensions of the problems confronted in ‘normal’ or ‘daily’ life (Wisner 1993; Cannon 2000). Situational analysis recognizes three kinds of contingency. Firstly, social vulnerability is not a permanent property of a person or group but changes in respect to a particular hazard. The second kind of contingency concerns the constantly changing daily, seasonal and yearly circumstances of a person’s situation regarding access to resources and power. Finally, there is the contingency born of the complex interaction of particular overlapping identities and forms of empowerment or marginality.

A contextual and proactive approach

Communities and groups may, and increasingly do, appropriate the concept of vulnerability to enquire into their own exposure to damage and loss. This constitutes a radically different, new fourth approach to the assessment of social vulnerability. The employment of the concept of social vulnerability as a community tool also involves a thorough analysis with, and b, the residents of their own resources and capacities/capabilities. However, it is in the hands of local people that the logic of their situation- and the phenomenology of their living over time with risks-forces them to be aware of, and to discuss, their strengths and capabilities, as well as their weakness and needs (Wisner 1998; Anderson and Woodrow 1999).

Reviews of social vulnerability studies: Perspectives from Social Science

Social vulnerability not only focuses the characteristics of individuals but also their relationship with the society in wider context, the nature of their relationships and the physical and societal environment they inhabit. In this context Fekete (2008) defines “social vulnerability is often hidden, complex and nested in various human aspects and contingencies bound to different levels of society”. Whereas Wisner et al. (2004) are of the opinion that “it is the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recovery from the impact of a natural hazard. It involves a combination of factors that determine the degree to which someone’s life, livelihood, property and other assets are put at risk by a discrete and identifiable event in nature and in society”.

Kelly and Adger (2000) discussed the approaches of the assessment of vulnerability to climate variability and change and tried to find out the relationship between the concepts of vulnerability and adaptation. They have defined social vulnerability

in terms of the capacity of individuals and social groupings to respond to- that is, to cope with, recover from or adapt to-any external stress placed on their livelihoods and well-being, focussing on socio-economic and institutional constraints that limit the ability to respond effectively. Poverty reduction, risk-spreading through income diversification, respecting common property management rights and promoting collective security are the four main priorities identified for action to improve the situation of the most exposed members of many communities. They argued that a sustainable response must also address the underlying causes of social vulnerability, including the inequitable distribution of resources.

Cannon et al. (2003) argued that social vulnerability is much more than the likelihood of buildings collapsing and infrastructure being damaged. Social vulnerability was described by them as set of characteristics that includes a person's initial well being (nutritional status, physical and mental health), livelihood and resilience (assets and capitals, income and qualifications), self-protection (capability and willingness to build a safe home, use a safe site), social protection (preparedness and mitigation measures) and social and political networks and institutions (social capital, institutional and environment and the like).

Dwyer et al. (2004) had developed a methodology to assess the vulnerability of individuals within households to risk from natural disasters. Since their study was focused on measuring vulnerability, they have selected thirteen vulnerability indicators such as age, income, gender, employment, residence type, household type, tenure type, health insurance, house insurance, car ownership, disability, English language skills and debt/savings as well as two hazard indicators like residence damage and injuries etc. Their study hopes to contribute to the ongoing development of vulnerability assessments that assist decision makers in safeguarding communities. With future refinements and developments this approach has the potential to contribute to policy development affecting natural hazard management at a government level.

Downing et al. (2006) defined six factors to characterise social vulnerability such as the differential exposure to stresses experienced or anticipated by the different units exposed, a dynamic process, rooted in the actions and multiple attributes of human actors, often determined by social networks in social, economic, political and environmental interactions, manifested simultaneously on more than one scale and influenced and driven by multiple stresses. They had underlined the fact that the concept of social vulnerability encompasses various vulnerability features, which are driven by multiple stresses and differential exposure, and are often rooted in multiple attributes of human actors and social networks.

Zou et al. (2010) had undertaken a comprehensive systematic analysis of the scientific literature on coastal hazards to identify the factors contributing to hazard vulnerability, to determine the relationships between them, and to review recommendations for vulnerability reduction. Some of the social-economic factors contributing to coastal hazards vulnerability are human condition and basic rights, development, macro economy, livelihood, infrastructure, institutions, social culture and behaviour, demography as well as geography and environment whereas factors relating to disaster risk management are mitigation, early warning, response, post-disaster recovery etc. The most important factors contributing to coastal hazard vulnerability (demography, poverty and marginalization's) are inherent characteristics of human society, affecting vulnerability through multiple pathways and processes. They were of the opinion that instead of using these issues as starting point for developing strategies for reducing vulnerability, most of the recommendations are concerned with measures that enhance coping and responses to the hazard event itself. An ideal process from research to the development of policies and actions to reduce hazard vulnerability is an integrated process with links and feedbacks from different parties whose realization needs more efforts from both the research community and the practice community.

Lynn et. al. (2011) in their synthesis of literature illustrates information about the socio-economic, political, health, and cultural effects of climate change on socially vulnerable populations in the United States as well as some examples of

Canada. Their synthesis defined and described social vulnerability, equity, and climate justice and key issues, themes, and considerations that pertain to the effects of climate change on socially vulnerable population are identified. Their document contributes to the debate, dialogue, and efforts associated with climate change policy and program development by providing a synthesis of key literature related to the social vulnerability of indigenous peoples and urban and rural communities. Their literature underscores the importance of considering how human populations differ in their response to, and engagement in, climate change processes. They also revealed that coping and response capacity of human population is an important dimension of climate vulnerability. They have pointed out that continued exploration of climate change and social vulnerability through social science research will provide the research community and on-the-ground practitioners with a stronger understanding of the populations most at risk.

Mallick, Rahaman, and Vogt (2011) attempted to understand the challenge of how to tackle the complexity of social systems, and patterns of vulnerability in those systems in context of cyclone SIDR 2007 in Bangladesh. They applied systematic random sampling to conduct household survey of sample size of 124 households in the Baniasanta union of Dacope Upazila in Khulna district of Bangladesh. Out of the 124 respondents only 14 respondents were female due to prohibition to talk to strangers or unknown people. In-depth interviews were taken for the victims of Sidr and some old people about their experiences with disasters. They found that heterogeneous characteristics (daily labourers, fishermen and small businessman, hunting and trading) of the respondents made the impact of disasters vary from individual to individual, group to group and community to community. And at the same the affected community waiting for relief and reconstruction materials attracts “dependency on relief works” which makes them more “vulnerable” to other calamities. So in the long run this increases the poverty ratio and pressurizes them to stay in a “vulnerability trap” in any type of calamity. They have pointed that out a holistic approach with vulnerability and local knowledge as a concept of assessing disasters within their cultural, socio-economic, political and environmental context is a must for disaster mitigation and planning. It will be very useful to utilize the social capital i.e. social integration, social cohesion, solidarity, networking, multiple-way communication between and among members of the community to fight against different disasters.

Yoon (2012) had studied to examine and compare the methodologies being developed in assessing social vulnerability to natural disasters. From the findings of existing literature it shows that two methods i.e. (1) a deductive approach based on a theoretical understanding of relationships and (2) an inductive approach based on statistical relationships (Adger et al. 2004) have been used in developing social vulnerability indexes. His study uses both the methods in assessing social vulnerability to natural disasters in the Gulf of Mexico and Atlantic coastal countries. For the first method he replicates the method used by Cutter et al. (2003) to select social vulnerability index variables (SoVI) whereas for second approach, he employs all social vulnerability index variables used by Cutter et al. (2003), but creates a different social vulnerability index in terms of the concepts of a people’s vulnerability which are determined based on social achieved status (e.g., poverty, educational level, employment, occupation, etc.) and social ascribed status (e.g., gender, age, race, ethnicity, etc.). The findings of his study suggest that emergency managers could select either inductive (e.g., factor analysis) or deductive (standardization method) to assess social vulnerability based on various conditions including their knowledge and analytical ability on vulnerability assessment, vulnerability data availability, and emergency management strategies. Achieved social status of residents, including poverty (e.g., percent living in poverty), is the most statistically significant indicator vulnerability to disasters in these coastal counties.

Laila, Fariya (2013) tried to assess the social vulnerability of the south-western coastal communities of Bangladesh in her study which is becoming more vulnerable, and also tried to understand the underlying social conditions of coastal people who are dependent on limited natural resources. She analysed the vulnerability indicators of exposure, sensitivity and

adaptive capacity based on the components proposed by the Intergovernmental Panel on Climate Change. The exposure component shows that geographical locations and housing structures of the studied communities are vulnerable with the senior and disable people among the most vulnerable groups. Whereas sensitivity is analysed by the indicators such as sanitation, water condition, livelihood activities, monthly income and food security. Her study result shows that communities in the area have close dependency on natural resources such as water and also a limited set of livelihood options. Low preparation by the communities to the adverse effects of climate change was found. Telecommunications like radio or television can play an active role during emergency, absence of them in the community make harder for governmental or local administrations to distribute information effectively. She suggests more intensive study on the adaptation options and coping mechanisms related to the living in the south-western coastal region of Bangladesh in order to achieve sustainable developments in the coastal society.

Conclusion

From the various review studies it is found that social vulnerability due to natural disaster results from “poverty, exclusion, marginalization and inequities in material consumption. It is also determined by physical, social, economic, and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards and is conceptually located at the interaction of nature and culture” that also links “social and economic structures, cultural norms and values and environmental hazards”. Most of the authors are of the opinion that some people within the social systems like ethnic minorities, disempowered castes or classes, religious groups, or occupations may live or work in physical areas that are relatively disaster-prone. Due to the result these groups of people are more vulnerable to natural disaster. Lack of access to resources such as information, knowledge, technology and limited access to political power and representation are also the factors that affect social vulnerability. So disaster studies should focus on immediate and long term vulnerability reduction, both in terms of natural disaster risk and social vulnerabilities. There must be interdisciplinary and cross-cultural studies of natural disaster impacts and social vulnerabilities. Social scientists needs to continue to seek practical ways to incorporate local technical knowledge, insight, skills, desires, and needs into the management of disaster situations, so that local people and institutions might be affirmed in identifying problems and offering solutions towards the management of their own situation, and that local capacities may be strengthened to resist future emergencies. For tackling disasters adequately, we have to evolve a holistic perspective. The poor and other marginalized sections of the society that includes women, the handicapped, the infant and the old and aged are the first to lose their basic right to food, shelter and health. They need and deserve help from the empowered sections of the society. So, studies should be conducted to empower and ensure the development of this weaker section of the society.

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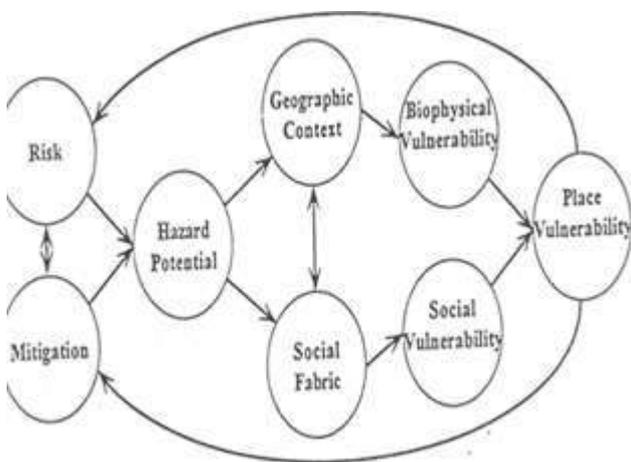


Figure 1: The Hazards-of-Place Model of Vulnerability Cutter et al. (2003).

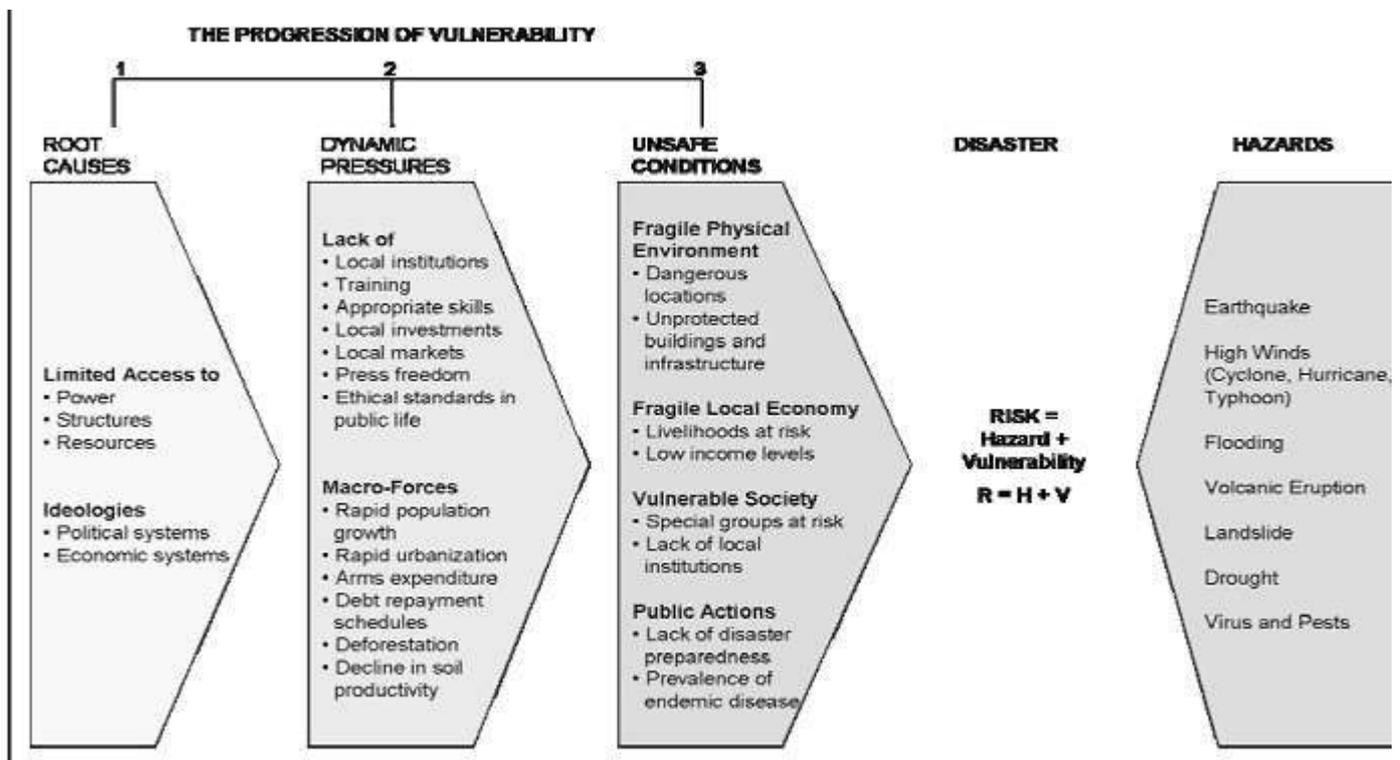


Fig 2: The Pressure and Release Model of Blaikie et al. (1994:23)

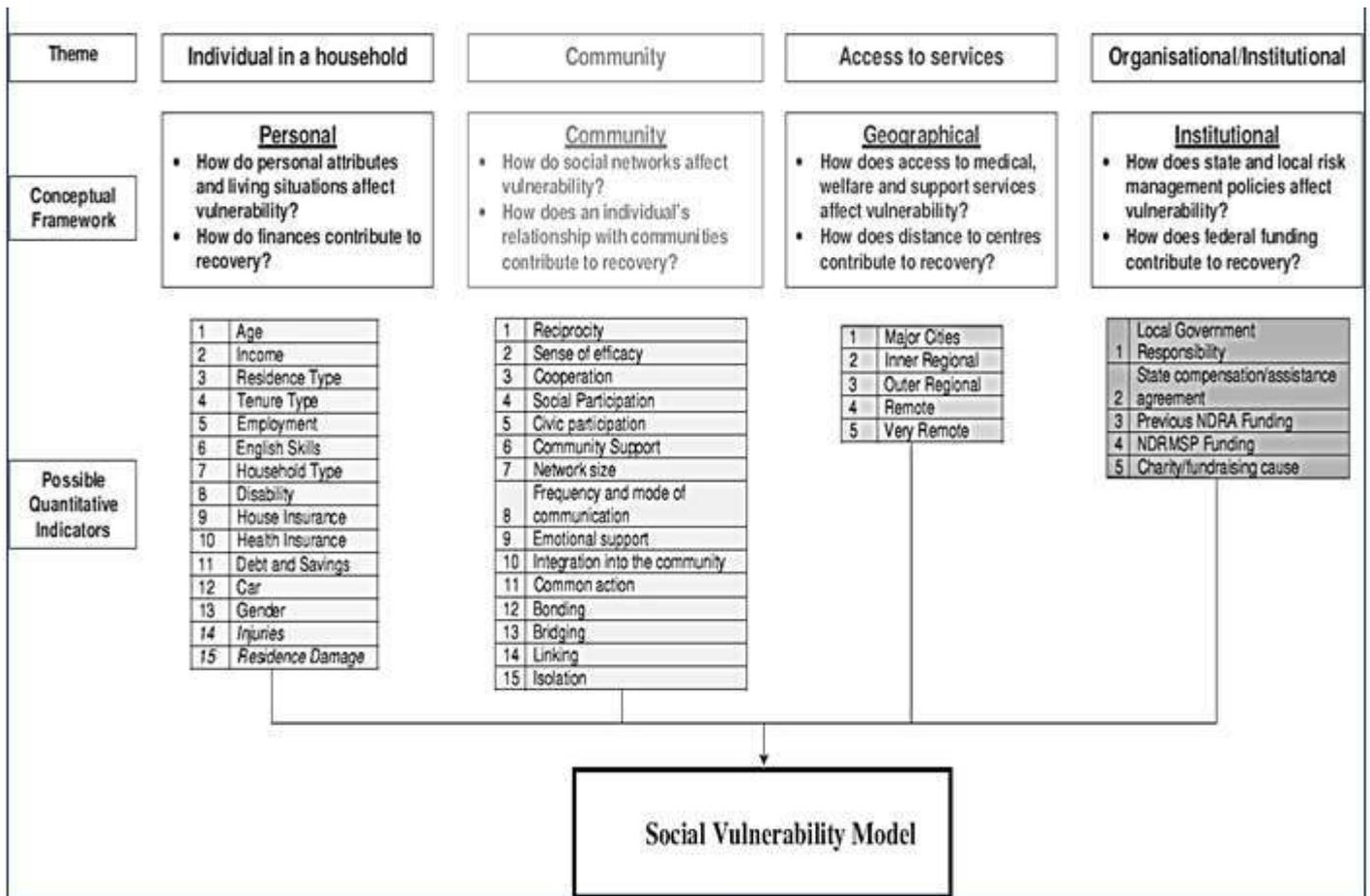


Fig 3: Social vulnerability model (Dwyer et al. (2004:5)

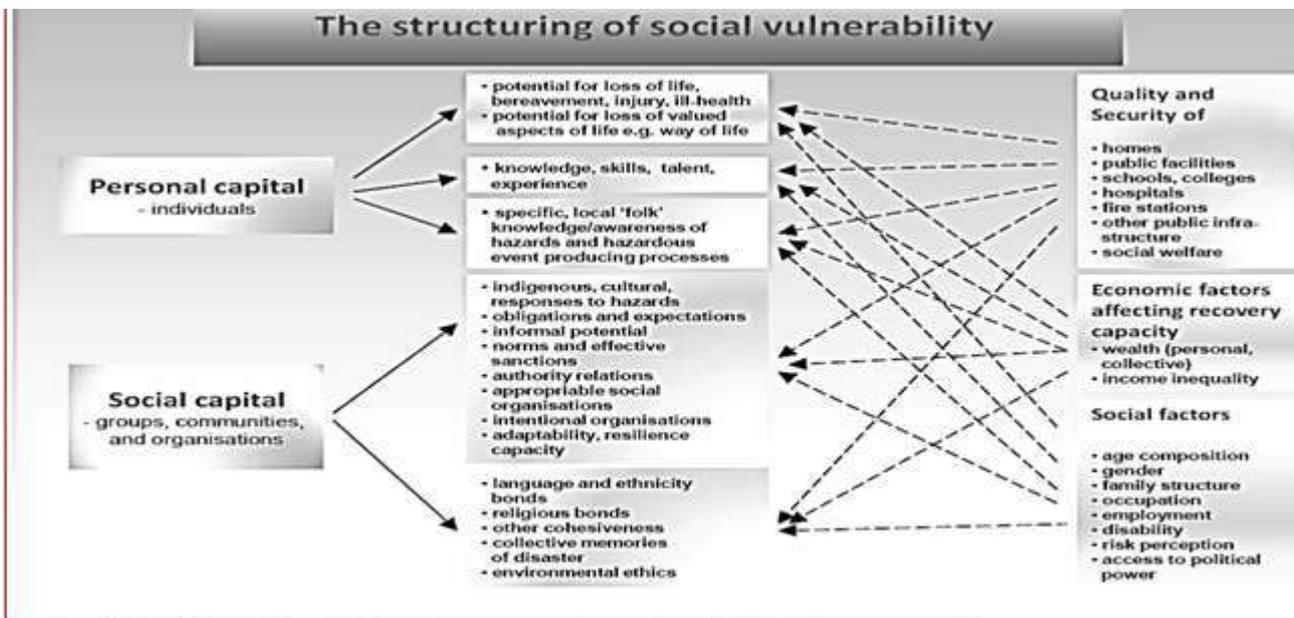


Fig 4: Adapted framework for approaching social vulnerability (Parker et al. 2009; cf. Tapsell et al. 2010)