Hazard, Risk and Resilience: A Socio-Economic Perspective

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Abstract

Hazard and related risk is an inescapable part of life. Every day we all face some degree of personal risk whether it is a life and limb in a road accident to our possession from theft to our immediate surroundings from noise and other type of pollution. It is impossible to live in totally risk free environment. The concept of vulnerability is a measure of risk combined with the level of social and economic ability to cope with the resulting event. Risk and vulnerability a community identified as the degree to which a system or part of a system may react adversely to the occurrences of the hazardous event. Resilience is a measure of the rate of recovery from successful experiences reflecting the capacity to absorb and recover from the occurrence of hazardous event. This study analyses hazard induced risk and resilience and related recovery measures as a major socioeconomic phenomena for both developed and developing countries.

Keywords: *Hazard, Environment, Risk, Vulnerability, Resilience, Recovery*

Introduction

About 25% of world population lives in areas of risk from natural disaster but the most vulnerable people are the poorest (Smith 1998). It has been estimated that the richest billion people on the planet have an average income of about 150 times that of the billion poorest people who have little choice but to locate in unsafe settings where this be urban shanties or fragile natural environment.

Traditionally resilience has been the major weapon against hazard in the less developed countries where disaster is often accepted as a normal part of life (Smith, 1998). Reliability on the other hand reflects with which protective devices against fail. This approach is more applicable to the most developed countries where technology and engineering design have provided a high degree of reliability for most urban services. However the society level view of vulnerability has challenged by Blakie et al (1994) on the ground that is people rather than disembodied system – which have to deal with disaster.

In the less developed countries broad and complex socio- economic problems combined with insecure physical environment to create a high degree of vulnerability. Environmental degradation and development decision contribute increasing to disaster impact. Problem including organizational structure, which embrace everything from poor roads and untrained civil servants to lack of welfare programmes, which result in inadequate housing and health provision combined with low nutritional status.

Hazard and Risk

Hazard is an inescapable part of life. Every day we all face some degree of personal risk whether it is a life and limb in a road accident to our possession from theft to our immediate surroundings from noise and other type of pollution. It is impossible to live in totally risk free environment. Most approaches to reduce system scale vulnerability can be seen as an expression of either resilience or reliability (Smith 1998). And it is expected that public concern about risk continue to increase in future despite the fact most people are enjoying longer healthier lives (Smith 1998). Risk is sometimes taken as synonymous with hazard but risk has the additional implication chance of particular hazard actually occurring.

Hazard is best viewed as a mutually occurring human induced process or event with the potential to create loss e.g. a general source of danger. Risk is the actual exposure of something of human value to a hazard and is often regarded as the combination of probability of loss. Thus we may defined Hazard (or curse) vas a potential to threat to human and their welfare and risk (or consequences) as the probability of specific hazard occurrence. The distinction was well illustrated by Okrent (1980).

Although the environment is clearly something that human values, it is structurally prioritized less by people when they faced threat to their own life or immediate possession. Just as hazard can be ranked, so that probability of an event can be placed on a theoretical scale from Zero to certainty (0 and 1) The relationship between hazard and probability can be used to determine the overall degree of risk. Whilst damage to goods and environment can be extremely social and economic in terms it is normally accepted that a direct threat of life is the most serious risk faced by humans. According to Dinman (1980), risk from natural hazard are much higher than those associated with man induced hazard

For people in less developed countries the overall risk of hazard related death is probably 3 to 4 times that of the richer nations. The main types of threat are also rather different Heyman et al (1991) placed a worldwide hazard data for the period of 1964 to 1989 into 5 categories according to the no. of events and their impacts in terms of the no. of people killed and adversely affected. Heyman et al (1991) have also that hydrological disasters are the most common hazards.

Assessment of Risk

Risk can be completely eliminated, the only option is to manage it. The first step of risk assessment which is undertaken to find out what the problems are. It involves evaluating the significance of a given quantitative measures of risk in an integrated way. In practice the risk of disaster has not yet been estimated for many hazards. Even when risk have been quantified by statistical or other analytical methods, great uncertainties usually attached to the estimate obtained. Quantitative risk assessment is usually a process accessible to only technically well informed minority. If so, at best may limit the amount of public debate and at worst it can be used manipulatively to justify the conclusion that the practitioner wishes. Risk also need in a comparative way as well as absolute way in order to draw spending priorities for what will inevitably be limited resources. Generally speaking risk assessment is such a complex concept that a single scientifically repeatable solution will rarely satisfy all the political social realities of the decision making process (Smith, 1998).

Neither risk assessment nor risk management can be divorced from value judgment and choices which in turn are conditioned by individual belief and circumstances. Many people make decisions and take actions regarding hazard based on their personal perception of risk rather than of some objectively derived measure of threat (Smith 1998). Because of this, risk perception has to be regarded a valid component of risk management alongside more scientific assessments. Distinction are frequently drawn between objective and perceive risk. Largely because people perceive some risk very differently from the predictions made by more objective assessment models. Resolving the resulting conflict between the results of technical risk analysis and more subjective risk perception is a major factor in most hazard management strategies. The type and degree of perceived risk varies greatly between individual age sex according to personal factor such as location, occupation and life style.

Involuntary Risk

These are risks which are not willingly undertaken. They are often relatively rare but typically have a catastrophic potential impact. The risk may be unknown to the exposed person. If the risk is

perceived it may not be seen as uncontrollable. Most of the hazard considered fall into these category and represent the risk imposed as a result of living in a particular environmental setting.

Voluntary Risk

These are risk which are more willingly accepted by the people through their own action. Such risk are likely to be more common, have less catastrophic potential and more susceptible to control Unlike involuntary risk they are more rated more directly by individuals according to their own judgments and life-style. The greater scope for control over voluntary risk is seen in either individual behaviour or some form of Government action.

Natural hazard are seen as involuntary. But the inundation in very active flood plains is sufficiently frequent and well published to cast doubt on this. Some flood plain dwellers may select to buy a home which is cheaper than an equivalent property in a safer area of town and then feel less need of expenditure on house maintenance. Viewed in this light the locational decision is both voluntary and economically rational. Voluntary risk takers are sometimes seen as a more personally identifiable group of people. Despite this problem, people have been shown to react differently to voluntary risk which are seen as imposed by some outside body. A correlation between the physical risk of death to an individual, expressed as the statistical probability of fatality per hour exposure to a particular hazardous activity and the assumed social benefits of that activity converted into a dollar equivalent. Unfortunately problems arise when analytic approaches, usually based on analogies with financial cost- benefit analysis, do not match with the more intuitive evaluation of risk practiced by individuals (Starr and Whipple, 1980).

There is still lack of understanding to informed consent about risk taking and the information which is needed to enable to individual to make rational hazard related decisions. This is difficult to achieve because of constantly changing views of acceptable risk i.e. after a rare and damaging event, there may well be calls for community protection up to a much higher level of safety. For example, the floods of Upper Mississippi river basin (1993) had an estimated return period of more than 1 in 2000 years, yet some people who were flooded asserted that this event should now be regarded as an unacceptable risk. Such arguments ignore both the economic and social benefit derived by those communities from their flood plain location over the previous 100 years or so when few flood losses occurred and the cost to tax payer in protecting flood plains against the flood of 1993 magnitude.

Methods of Risk Analysis

The statistical analysis of risk is based on mathematical theories of probability and scientific methods for identifying casual links between different type of hazardous activity and the resulting adverse consequences also important to understand the causes and characteristics of risks as well as mathematical probabilities. Kates and Kasperson (1983) however provided a detailed steps of risk assessment.

Because probability analysis is the most common method of resolving uncertainty, a knowledge of the magnitude and frequency of occurrence of damaging event is a vital element in hazard management. For example, given adequate records, statistical methods can be used to show that of floods of certain sizes may on an average be expected annually, every ten years, every hundred years and so on. Apart from this engineering application a knowledge of flood frequency is necessary for other hazard management strategies, such as flood plain zoning and flood insurance.

Conclusion

To assess the risk from hazard, vulnerability is a measure related to the socio-economic pattern of the area. Understanding risk and vulnerability requires more to understand societal past and present relations in regard to disaster and development. Risk depends not only on people's perception

and knowledge but on complex social relations and processes. Thus, it is needed for more dynamic local or regional level analysis that makes vulnerable people from hazard - risk to become resilient.

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