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Perception of risk and coping capacity: A study in Jiadhal Basin, India

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ABSTRACT

The River Jiadhal in North East India experiences huge siltation due to a process of landslides and erosion coupled with heavy rainfall. This normal phenomenon is translated into a disaster when the river breaches the embankments and the villages in the floodplains of the lower basin experience floods. These floods carry highly silted waters and when they leave the floodplains, the agricultural lands remain dumped with sterile sands which prevent the farmers to practice their annual farming activities. The two major communities living in the lower basin have to force themselves to live with this new disaster. This paper investigates the role of perception in their ability to cope with the disaster. Questions were asked about the primary cause of the disaster they perceived to be and this was related to their ability to cope. It was found that when the respondents perceived the cause as understandable and visible, their coping was better. On the other hand when they perceived the cause to be invisible and hidden from their realm of understanding, their coping was low.

1. Introduction

A disaster leaves a scope for a community to adjust itself to its effects. This adjustment can be short termed or long, sudden or planned or even before the disaster. If it is in the form of a sudden onset, it is coined as coping which is often related with a major event. On the other hand, when the adjustment is a manifestation of a repeated exposure to the disaster events, and the time scale of adjustment is relatively longer it is often the term adaptive capacity that is more often heard. The attributes that differentiate between coping and adaptive capacity is in the time scale as well as in the aspects of the society's resilience and the ability to learn, experiment and change itself [7]. Quite often, adaptive capacity is used in the context of climate change and its triggered disasters. The relationship of a society to either cope or adapt itself with the consequences of a disaster are dependent on many factors. Some factors such as empowerment, optimism, innovative thinking, self-esteem and perception about the risk may be important in determining how well people cope [10]. Though perception cannot be considered as a proven knowledge it is important in understanding the behaviour of people during a disaster [3]. The chapter 18 of the report of the working group II to the Third Assessment Report (TAR) of the Intergovernmental Panel on Climate Change (IPCC) highlights eight such factors which are significant. This paper looks into the factor eight that says that public's perceived attribution of the source of stress and the significance of exposure to its local manifestations is a major determinant of their capacity in the background of a disaster.

2. Background

Coping is a community's or an individual's way of using existing resources within a defined boundary of expectations to achieve certain goals [5]. Dynamically, it can be stated as a number of interactions of a person's own set of resources, values and commitments and the resources, demands and constraints of an adverse environment [12]. The need to understand coping in the realm of a disaster emerges from the fact that coping can be different from person to person and one community to another and this ability shapes somebody's resilience. A better resilient community has the edge to offset the ill effects of a disaster effectively. The fact remains that resilience can be built at different levels of the society if it is understood how coping is achieved. Some effective external processes include assessment and monitoring the risk, implementation of warning systems and raising awareness among the common public and the government machinery. Moreover, a culture of responsibility, planning, co-operation and investments are internal backbones for this process. During coping, some antecedent conditions play a major role. Perception about the source of risk is one of the factors that shapes how coping performs. This lays the basis that risk can be a perceived as an end result of a judgment not necessarily based on pure fact [2]. It is the probability associated with the Bayesian way of thinking that 'Probability' is an expression of the 'State of Knowledge' that depends on the available information and the knowledge of the individual who assigns it. Hence, it affirms that no true probability exists and so neither exists a true probability of occurrence of a hazard. That is why risk is an intuitive judgment in the context of a

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limited and an uncertain information [24]. It depends on the judgment of the characteristics of the hazard how it is felt and leaves a scope for comparison among various risks. Risk in social science always has more than an objective characterization of the distribution of the harmful events. It is seen more as an inherently subjective matter from the point of view of those who experience it [17]. To quantify risk both in an objective and a subjective way is a complex and a judgmental process. This 'Perceived Risk' almost always undergoes an amplification when it comes to the risk perceived as a whole by the society that leads to an unexpected behavioral response [16]. The factors influential in the amplification process are the degree to which information is disputed, the extent of dramatization, and the symbolic connotations of the information. The link with perceived risk and coping has a cyclic direction. While perception helps to shape the coping, the basis of perception emerges from ones local knowledge, experiences and available coping opportunities. This may also explain the fact why despite adequate measures taken to reduce the impacts of a disaster, the variability of outcomes is conspicuous from one community to another even with the same set of warnings and awareness generation mechanisms at place. In the absence of a good understanding of perception and social setup that constructs this perception, the technical solutions alone often fails to build up resilience of the population. Arriving at a functional set of coping capacities is a challenge since it has its roots in the vulnerability of a system and many of the variables of vulnerability are difficult to quantify and best be described qualitatively [26]. On the other hand, the techniques and literature for vulnerability assessment is at an infant stage compared to hazard assessment [6]. Some of the indicators need a macro or country level and some need a local or micro scale evaluation. Sometimes due to a deficiency of data at the micro level national level assessment are first carried out and the results are scaled down to a micro level. However, this involves many generalizations and thus there are loss of information [11]. In terms of the development of the indicators, the literature is divided in sectors of vulnerability, resilience, risk and adaptive or coping capacities. In terms of approaches there are four distinct approaches to derive vulnerability much shared by the disaster risk reduction and the climate change adaptation communities [7]. At the same time the approach to deduce these indicators may be either top down or bottom up [20]. The indicators at a macro level may group countries with a low adaptive capacity but there is an argument that since the ultimate sufferers of the disaster are the people and the individuals, the micro level indicators are a more indicative of a society's actual adaptive capacity [22].

2.1. A brief description of the study area

Jiadhal River is one of the North East Indian Rivers that shares two states of Arunachal Pradesh and Assam (Fig. 2). Like many other rivers of the states, it is the prime source of agriculture in the basin and at the same time the source of one disaster. After the year 1980, the river has started to dump huge amounts of sands on the agricultural lands in the downstream Dhemaji District (Fig. 1). There are two major communities in.

the floodplains struggling to cope with this disaster. These are the Mishings and the Non-Mishings. Population wise, Mishings are the largest tribal group in North East India. They are believed to be a mixture of East Asian as well as Southeast Asian sub race of the Mongoloids from inside political China and bear their cultural and linguistic similarities with many Tani tribes in Arunachal Pradesh. It is believed that their migration started somewhere in the 13th century towards the plains of Assam [15]. The Non-Mishings in the study area are considered those communities consisting of Other Backward Classes (OBC), Scheduled Castes (SC) and the Ex-Tea Garden community as defined by the constitution of India.

These two communities are equal victims of the disaster but within them, there is a difference seen in their coping capacity. A section of the population are optimistic about finding a solution to the problem and some are not. The paper argues that their coping is highly influenced by the way they perceive the cause of the risk. The background of the belief lies in the setting that human seems to have a control over the things when they perceive to be understandable, visible and tangible and prepare well for the consequences and vice-versa.

2.2. An analysis of coping mechanism in the study area

The floods have been a normal phenomenon in the area till 1980. After that year, the agricultural lands started to witness large amounts of sand casting when the floods receded. The increase in the deposition and siltation 40 years ago is believed to have been caused by a sudden and rampant deforestation coupled with an increase rainfall in the upper basin. So, the practice of coping is almost four decades old for the study population. The paper has analyzed coping viewing it as a composite of three major components. These are the economic condition of the families, the social bonding among the families and the availability of some structural means to cope to the adverse effects of the disaster. Accordingly, they are named as economic, social and structural coping and headed under major components of coping (Table 1). Each of the major components are divided into five indicators or sub components. Some of those have been adopted from similar studies in neighbouring Bangladesh and Vietnam taking into consideration the similar economic and cultural background of the respondents and some of the indicators are adopted through a pre-questionnaire pilot study in the area.

During the pre-questionnaire survey and focus group discussion, it was found that the respondents perceived the cause of the risk due to four main reasons. Those have been named as the primary cause of the risk for the study. Further, those were categorized under a Visible or an Invisible cause. Some respondents believed that due to the government's failure at the administrative level, the whole system has been failing chronically but they were not sure about the particular office

Fig. 1. An abandoned building and an R.C.C bridge due to sand casting. (deposition of the coarse fraction of the load over the flood plains).