SUSTAINABLE POST DISASTER RECONSTRUCTION THROUGH INTEGRATED RISK MANAGEMENT - THE CASE OF RURAL COMMUNITIES IN SOUTH ASIA

Rohit Jigyasu
Architect, Planner and Conservation Consultant, India

ABSTRACT

Ensuring sustainability of interventions undertaken as part of post disaster reconstruction is one of the crucial challenges confronting the developing world. There are enough examples to show that in many cases, reconstruction serves to reinforce and sometimes-even increase the vulnerability of local communities. This is well exemplified in India by the case of reconstruction following Latur earthquake in 1993, Orissa super cyclone in 1999 and Gujarat earthquake of January 2001.

In the light of these challenges, the paper will elaborate on the methodology, tools and techniques for integrated risk management, which is readdressed from a holistic and dynamic perspective. The term 'risk' is redefined in an integrated manner with respect to exposure to one or more hazards as well as other factors determining vulnerability in developing countries. The term 'vulnerability' is assessed not only as product of hazard exposure but in a progressive manner resulting from social, economic and underdevelopment processes, before, during and after disaster situations.

The paper will further attempt to redefine disasters as a continuum where actions taken during various phases have an impact on each other, thereby emphasizing the need for establishing various backward and forward linkages while deciding different actions and interventions at various stages.

The paper will conclude by elaborating on the proactive tools, techniques, strategies and actions for risk assessment and control at various stages with respect to a disaster situation and thus address various types of risks in an integrated and dynamic manner.

Keywords: Reconstruction, Disaster Vulnerability, Local Knowledge and Capacity, Disaster, Risk, Risk Management, Cultural Heritage.

1. INTRODUCTION

South Asian sub-continent is exposed to various natural hazards leading to disasters, which cause immense loss of life and property. This includes irreplaceable loss to the rich cultural heritage in the region, both of tangible as well as intangible nature. The Orissa super-cyclone of 1999 and the Gujarat Earthquake of 2001 are enough to substantiate this argument. Such an immense destruction requires massive schemes for post disaster reconstruction, requiring not only provision of shelters but also rehabilitating social and economic structures which are badly mutilated as a consequence of these disasters.

Ensuring sustainability of interventions is certainly one of the crucial challenges while undertaking post disaster reconstruction. There are enough examples to show that in many cases,

Figure 1: Historic Town of Bhuj Devastated by 2001 Gujarat Quake in India

reconstruction serves to reinforce and sometimes-even increase the vulnerability of local communities. This is well exemplified in India by the case of reconstruction following Latur earthquake in 1993, where 'city-like' grid ironed layout for villages and import of 'modern' technology for construction of rural housing has failed to reduce peoples' vulnerability to future earthquakes. On the contrary, these have increased physical as well social and economic vulnerability of the local communities (Jigyasu, 2002)[1].

1.1 Reducing Disaster Vulnerability – Key Issues and Challenges

The underlying causes for increasing disaster vulnerability, both in pre and post disaster situation are essentially linked to the existing social, economic and political context and existing policy approaches for managing disasters. This in many instances is a result of existing development processes, whose implications on rural communities in the region are in the form of social and economic poverty and inequity, market economy and lack of proper education. Five main issues and challenges are evident in the context of rural communities of South Asia for reducing their disaster vulnerability through building local knowledge and capacities. These are:-

1. Loss of Material and Land Resources (from rural communities)
2. Loss of Traditional Skills
3. Cultural Incompatibility of External Interventions
4. Increasing Social and Economic Inequity
5. Weakening of Local Governance (Jigyasu, 2002)

With respect to the above-mentioned issues and challenges, various dilemmas of dialectical nature emerge in the case of these communities, which are discussed in the next section while revisiting the existing theories on disaster and vulnerability, the role of local knowledge and capacity and the paradigmatic base for disaster management, particularly through post-disaster rehabilitation. However, one must acknowledge that most of these theories though good to know, are applicable more to Western ideologies.

2. REDEFINING DISASTER VULNERABILITY

2.1 The Complexity of Relationships between vulnerability and Capacity

Vulnerability is essentially a set of negative conditions within a community, which may be a consequence of several factors. This may be due to inherent weaknesses of these communities or a consequence of external threats. In contrast, local knowledge and capacity is a result of positive conditions in a community. It represents the internal strengths of these communities and their external opportunities.

However, these negative and positive conditions do not make vulnerability and capacity as mutually exclusive. In fact disaster vulnerability is both the cause and effect of degenerating local knowledge and capacities and of conditions of poverty. This brings us to a critique of the capacity and vulnerability analysis Matrix by Anderson (1989)[2], which does not explore the relationships between vulnerabilities and capacities as mutually influencing conditions, rather it looks at them independently.

Disaster vulnerability is complex in the following respects:-

- It can encompass various aspects such as physical, social, attitudinal, economic, etc.).
- It may hold true with respect to one hazard or multiple hazards.

1 The author makes this conclusion on the basis of his doctoral research titled 'Reducing Disaster Vulnerability through Local Knowledge and Capacity' undertaken at Norwegian University of Science and Technology from 1999-2002. The Research analysed the long-term impact of reconstruction in Marathwada, India, following a destructive earthquake that struck the region in 1993. The transition phase from relief to reconstruction was also analysed in Gujarat, India, following 2001 earthquake.

2 Mary Anderson in her matrix defines vulnerabilities and capacities as two mutually exclusive terms, which are described in terms of three main aspects, namely physical / material, social/ organizational and motivational/ attitudinal. She further makes strict division between vulnerabilities and capacities on the basis of gender and economic status.

- It may hold true for the whole community or certain sections of it.

While exploring the inter-linkages between vulnerabilities and capacities, a significant aspect is their dynamic nature. This implies that vulnerability does not remain the same over a given time period, especially after a natural hazard such as earthquake. On one hand, certain aspects of vulnerability before the hazard form the context or setting for the disaster. On the other hand, reactive actions (as relief and rehabilitation process) may help in eradicating or reducing certain kinds of vulnerabilities, changing certain vulnerabilities to different kinds and reinforcing or compounding or strengthening or even increasing others. The vulnerability conditions can also change with time on their own through certain inherent community coping mechanisms or other practices.

Vulnerability to natural disasters can therefore be understood as 'products'[3] and 'processes', existing before as well as after a disaster. Certain aspects of disaster vulnerability precede a disaster, and thus create a setting for the disaster, thereby contributing to its nature and severity. These can get reinforced and changed after a disaster as a result of various response decisions, as well as the overall social, economic, political and institutional context. In spite of good intentions, certain aspects of vulnerability are carried forward since the underlying causes remain.

Also local knowledge and capacity that have potential for disaster mitigation are accumulative, continuously updating or changing (in positive or negative direction) in response to various situations, which are taken as part of learning processes through local initiatives. The internal world-views or perceptions dictate these learning processes and communication mechanisms, which develop over time, leading to creation, reception and accumulation of new knowledge.

Considering the dynamic nature of vulnerability and local knowledge and capacities, it is important to reflect on Mary Anderson's Matrix, which takes a static view on these terms. Communities are always in transition and as such, their vulnerabilities and capacities increase or decrease accordingly. Besides, there may be some hidden capacities and vulnerabilities, which may not be linked to one hazard or another but nevertheless characterize the strength and weakness of these communities in general. Moreover, in many situations, vulnerabilities and capacities pertaining to various hazards may compliment each other.

When seen in a time continuum, disaster vulnerabilities and capacities in the context of rural communities in India and Nepal can be described as the processes, which are the 'products' of;

1. Inherent social, cultural and economic transformation processes within communities.
2. Normal (under) development process.
3. Immediate and long-term disaster response, including those of emergency relief models by various NGO's.

These three factors affect the vulnerability and capacity of rural communities, and also affect each other.

In the following discussion, each of the above aspects of disaster vulnerability and capacity are elab orated in detail, highlighting the nature, dilemmas and challenges in the context of rural communities in South Asia.

2.2 Vulnerability as 'Product' of Social, Cultural and Economic Transformation Processes within Communities

The rural communities in South Asia have traditionally been coherent (to quite an extent!) entities with distinct social hierarchy but well-defined roles and relationships. However these communities are transforming in many respects, one of which relates to inherent structural changes in traditional patterns and relationships within communities, which determine their mutual support systems. These contribute to lessening their vulnerability, although one must admit that some of these patterns and relationships are exploitative

[3] The term 'product' is used here in a non-physical sense.

2.4 Vulnerability as Product of Immediate and Long-Term Disaster Response

We have examples from Marathwada and Gujarat to show that vulnerability is not only a pre-disaster condition. It is also a product of external human interventions and myths or perceptions of decision makers, undertaken as post-disaster decisions or actions, both immediate relief and long term rehabilitation, that in fact are originally intended to reduce vulnerability against such natural events. This is either because of wrong official policies for undertaking relief and rehabilitation or in many instances, a result of emergency, relief and rehabilitation models by NGOs. Many of these policies and models are dictated by the dominant paradigm of development, which is explained in the previous section. Take the case of Marathwada and Gujarat, where during post disaster rehabilitation, the decision-makers perceived provision of 'modern' and 'city like' layout and housing for the villages, as benchmark for their development. The negative consequences of these in the long run are evident in the Marathwada case. Also in these areas, provision of reconstructed houses is thought of as an end product for development of villagers.

Besides wrong policies, the ineffectiveness may be due to the overall social, economic and political context, within which disaster management takes place. For example, the forced displacement of the people after a disaster due to 'relocation' policies initiated by the Government may cause the loss of family kinship, which is very important in this region where there is lot of emphasis on extended families. Therefore, it is very important that the socio-cultural values are not destroyed through such wrong policies.

In fact, existing context shapes disaster management, which in turn also shapes the context. In fact wrong policy approaches can reinforce and in some cases, even increase existing resource dependencies, social inequity and at the same time, overlook local knowledge and capacities. Moreover, community participation in disaster management depends largely on the local power structure, which ironically, is reinforced by existing social segregation. Theoretical discussion on this issue will be done later.

Another significant issue pertaining to disaster management practiced in South Asian Subcontinent is that it has become a highly specialized discipline and various professionals and decision makers perceive various approaches for mitigation and rehabilitation within their own disciplinary field. For example, policy makers perceive relocation as a safe option based on the technical criteria of seismic safety, without considering the relationships to land, culture and livelihoods. Similarly, housing reconstruction is seen as a physical end product, without paying heed to the process of rural housing and its link to social structure, way of life and local economy. Similar issues emerge on the questions of transferring technology, which can make the structures highly resistant to earthquakes, but throw open questions on their affordability, cultural compatibility and sustainability in the context of rural communities in the region.

3. REDEFINING 'RISKS' AND 'DISASTERS' – A HOLISTIC AND DYNAMIC APPROACH

The above discussion throws light on the perspectives to the fundamental question; What is a disaster (Quarantelli, 1998). Conventionally, we tend to categorize various phases in relation to disaster (as pre, emergency and post disaster) for the sake of management. However, one needs to question whether disaster is a 'reality' or a

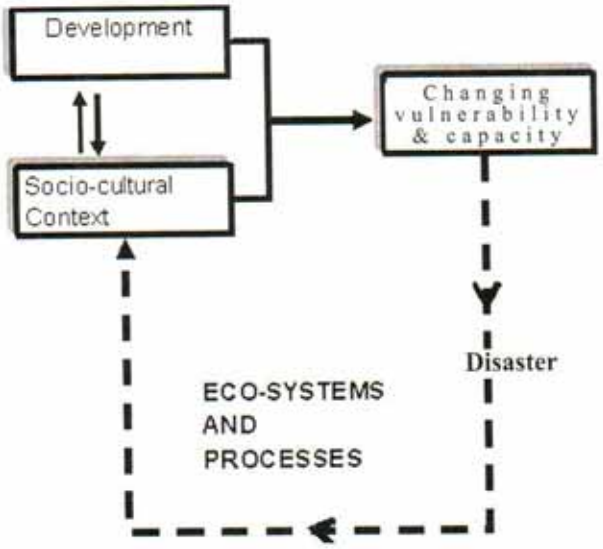

Figure 2: Relationship of Disaster, Vulnerability and Development.

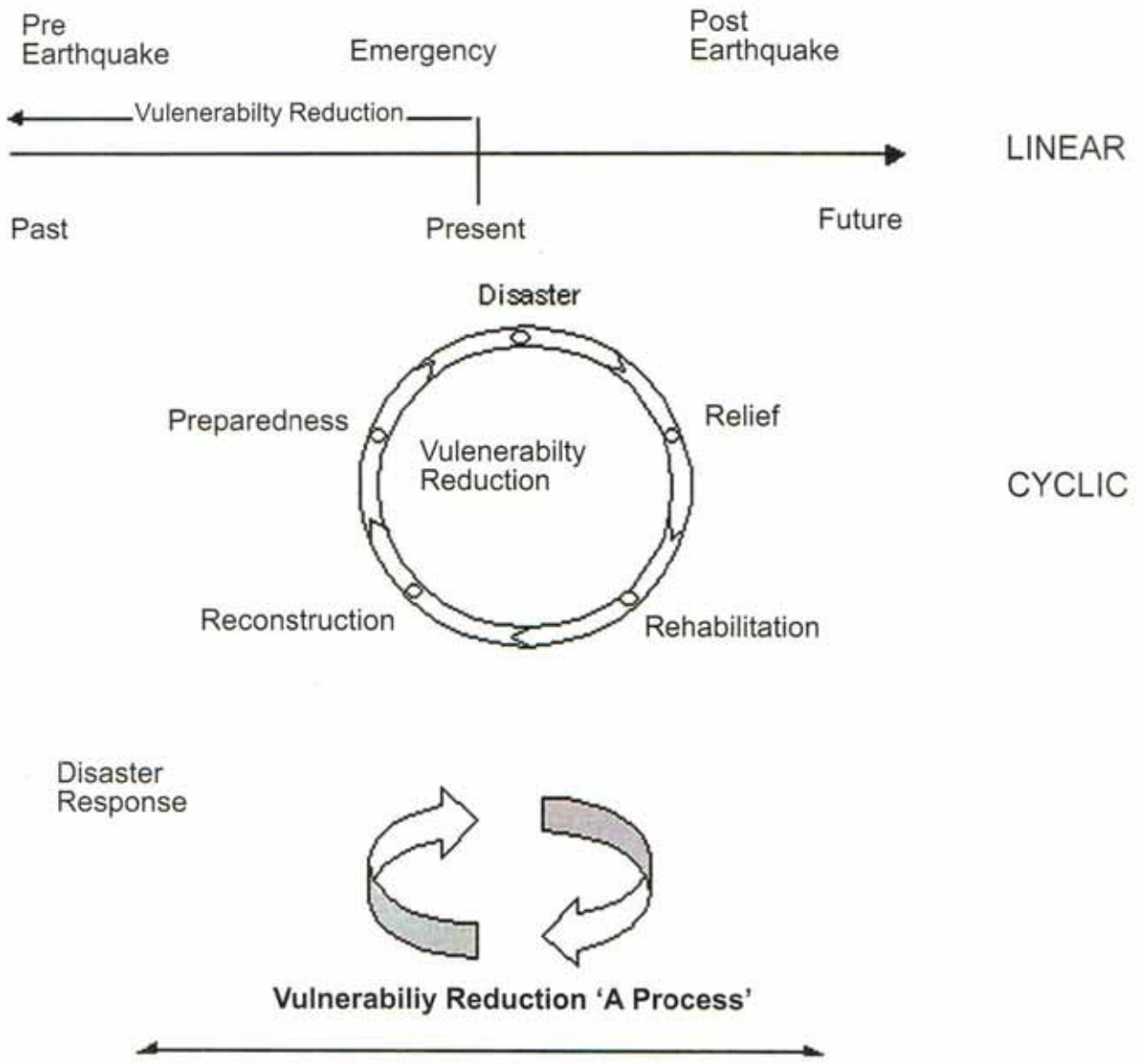

Figure 3: Vulnerability Reduction - Linear or Cyclic or Cyclic loop?

'construct' as it has been made out to be through these categorizations (Jigyasu, 2004).

The complexity and dynamism of vulnerabilities and capacities, makes 'disaster' a very loose and vague denomination, which does not have a starting or an ending point as these points can only be measured by developing objective indicators. Therefore, disaster situations need to be looked in a continuum, as actions taken during various phases have an impact on each other. This means that we need to establish backward and forward linkages while deciding various actions and interventions at various stages.

This also implies that disaster can only be measured for the phenomenological discussion of the nature and the increase and decrease in vulnerabilities and capacities before and in response to specific natural hazards.

Therefore, discussion of phases as pre-disaster or post disaster will not be appropriate. Rather, the shifts in magnitude, scale and severity of vulnerabilities and capacities need to be looked at various stages with reference to the particular hazard event, that catalyses these processes into disaster situation. These stages are:-

1. In the normal situation (without impact of natural hazard).
2. In the emergency situation (when the natural hazard has struck, extending to a few days or months after the event)
3. In the transition phase from relief to recovery (extending to a few months to a year after the event)
4. In the rehabilitation phase (over the years, when the rehabilitation process takes place).
5. After the rehabilitation phase in the long run (to assess the impact of post natural hazard interventions)

The above discussion also prompts a reflection on PAR and Access Model by Blaike (1994)[5]. This model essentially describes how vulnerability situations develop by elaborating on the causal relationships. However, the model is linear in its conception and conceives disaster as an end product.

In the above discussion, development is a

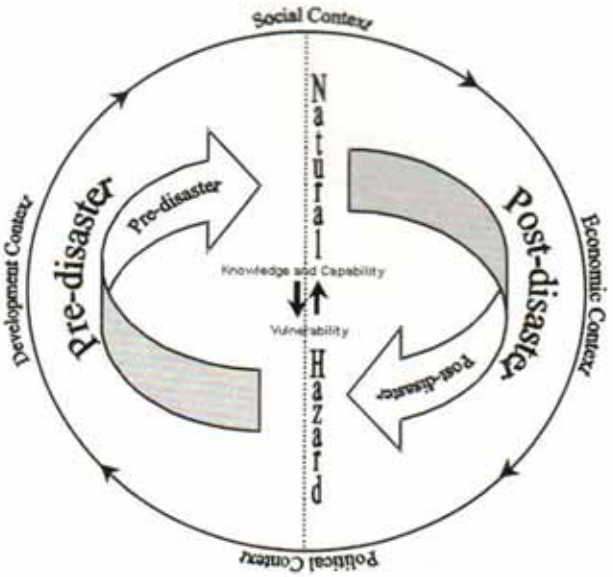

Figure 4: Vulnerability and Capacity as a Dynamic Process.

fundamental context within which all the above situations are intervened and take shape on the ground. Such a development is either externally driven or driven by the local communities. Therefore, in the disaster management cycle, development is not a phase in itself, rather it interacts and affects separately, each of the above situations and in turn, each of them are affected among themselves, ultimately shaping the developmental context itself.

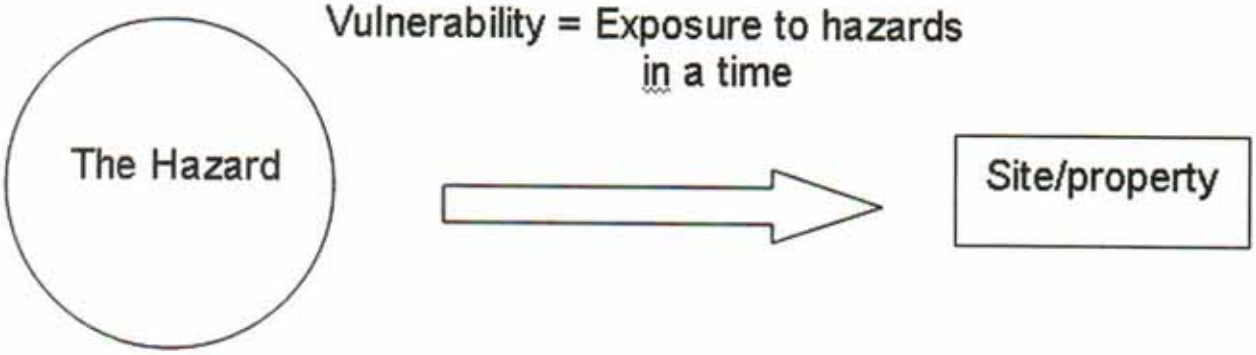

Figure 5: Conventional Method of Assessing Risks.

5 'PAR is a simple model of the way in which 'underlying factors' and 'root causes' embedded in everyday life give rise to 'dynamic pressures' effecting particular groups, leading to specifically 'unsafe conditions'. The access model is a more magnified analysis of how vulnerability is generated by economic and political processes.

3.1 The Understanding of Risks

However, disasters are very much a part of the overall risk framework. The term 'Risk' is understood as the product of Hazard and Vulnerability. In conventional terms, the risk of a site or a property is understood in relation to one hazard such as earthquake, floods etc. and vulnerability is understood as exposure of that site or property to that particular hazard in focus at one particular time. Moreover, vulnerability is understood mainly in physical terms.

Contrary to conventional means, the integrated method of understanding risks to a site or property may stem from exposure to one or more hazards and other determinants. This implies that we need to facilitate a holistic understanding of risks from various hazard sources (fires, earthquakes etc.) as well as to understand vulnerability processes, and at the same time, to incorporate specific actions or strategies for specific kinds of hazards. This also implies that we need to link physical vulnerability of both movable and immovable aspects of a site or property to that resulting from social, economic and under development processes. For example, the risks to the physical fabric are not only linked to the structural weakness but are also inherently linked to the social, political and economic context in which they are located.

Besides, the local meanings and perceptions are also worth taking into account, while understanding risks and disasters.

4. INTEGRATED RISK MANAGEMENT

'Risk Management' is a well-developed subject with well-defined components and universally accepted terms and definitions. It includes various proactive tools, techniques, strategies and actions for risk assessment and control at various stages with respect to a disaster situation. Therefore, we need to organize the subject of risk preparedness, primarily under the universally accepted phases of risk management (e.g. risk identification and analysis, risk evaluation, monitoring, prevention/mitigation, disaster preparedness, emergency response, long term recovery etc.) and then address the various types of risks.

Figure 6: Relationship between Risk Management and Disaster Management.

The risk management framework is a prerequisite for a disaster management framework. This implies that various activities undertaken during preparedness, response and recovery phase of disaster must be subject to risk identification, analysis, assessment and control. However, such a framework primarily advocates a preventive approach through forward planning / preparedness, so as to reduce the affect of momentary hazards such as earthquakes, floods and even slow ones such as droughts, and thus control the magnitude and intensity of disasters in the first place.

Various activities, tools and techniques for risk management in post disaster situation need to be part of the integrated risk management, so that their interrelationship with activities undertaken in pre-disaster and emergency situation can be explicitly articulated, besides the implications of the actions in the long-term perspective.

4.1 Integrated Risk Assessment

Risk Assessment undertaken, as part of integrated risk management will involve integrated vulnerability analysis on one hand and integrated hazard mapping on the other.

Integrated vulnerability analysis involves taking into consideration social, political, economic and attitudinal aspects of vulnerability along with

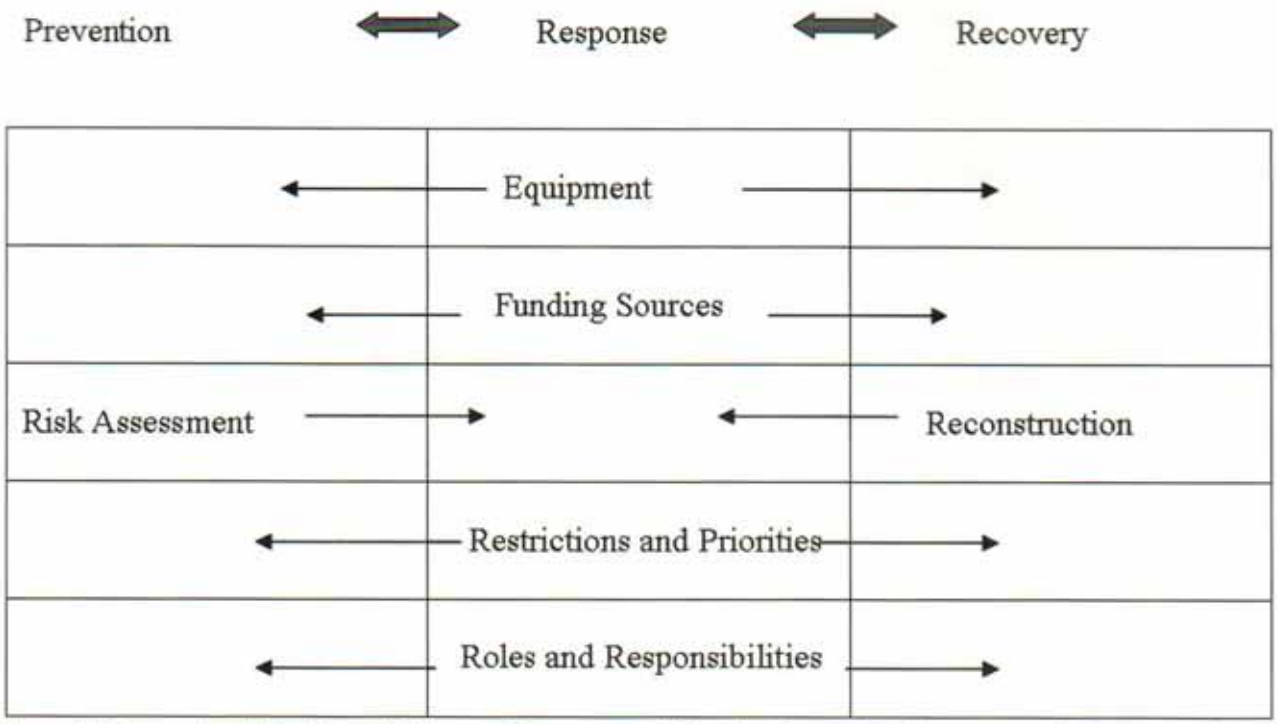

Figure 7: Forward and Backward Linkages Between Activities in Prevention, Response and Recovery Phases.

physical aspects for their impact on each other. Moreover, vulnerability is not only considered as a product in the form of exposure to one or more hazard at a particular time but also as a process over time.

5. REDUCING DISASTER VULNERABILITY THROUGH LOCAL KNOWLEDGE AND CAPACITY

5.1 Lack of Cultural Continuity & Compatibility – A Key Issue

Lack of cultural continuity and compatibility is certainly a key issue resulting in increasing disaster vulnerability. As discussed before, in the existing notions of development, decision makers as well as local people consider 'modernity' and 'urbanization' as panacea for development. However, these 'images of development' are seldom comprehended in reality because of the four main reasons: -

1. Ignorance of the local people on what 'modernity' implies in reality.
2. While the images are created, culturally deep-rooted thinking processes may remain unchanged, thereby creating a mutually contradictory dichotomy.
3. Lack of education, because of which local people may not be conscious and confident to be aware of their assets(resources), rights and duties.
4. Inability of the local people to afford and sustain whatever is perceived as 'modern'.

Essentially 'development' has no fixed frame of reference and is very much dependent on local cultural context. The definition of culture is well articulated by Rapoport (1984; 50-51), who highlights three important aspects of culture

1. "Culture as a way of life typical to a group, a particular way of doing things..."
2. ...As container of symbols, meanings and cognitive schemata transmitted through symbolic order..."
3. "...As a set of adaptive strategies for survival related to the ecological setting and its resources.

Figure 8: Key Variables for Integrated Risk Assessment.

The above definition demonstrates the all-encompassing nature of culture, in terms of what it implies for the rural communities. One of the main challenges is reinforcing cultural continuity through development opportunities that are afforded through post disaster rehabilitation, so that one does not end up with cultural incompatible solutions, which prove unsustainable in the long run.

In the context of post disaster rehabilitation strategies, cultural continuity and compatibility is not just the factor in perceiving overall development, but also needs consideration in vital aspects of 'earthquake safe' technology transfer. There are interesting references on the relationships between technological knowledge, and the qualitative aspects related to community relevance, social acceptance, etc. besides economic viability and long term sustainability.

5.2 Integrating Living Dimension in the Understanding of Cultural Heritage

A part of the strategy for bringing out cultural continuity and compatibility will be dictated by following the integrated approach in understanding the cultural resource itself which is the carrier of local knowledge and capacity. This clearly implies, three important elements of the cultural heritage, which are worthy of consideration (in themselves and for their interrelationships), namely local communities (the bearers), environment/ecology (human-environment relationships), built heritage including museum object and collections (the physical interventions). So cultural heritage at risk implies putting one or all of these elements at risk. Interestingly, this holds true for all the typologies of cultural heritage, even monuments / museum building, as they also exist in a definite context, which defines specific relationships to these three key elements.

Specific understanding of the impact on the cultural heritage of the place, which needs to be understood in the extended scope and definition to include not only monuments or historic buildings but also cultural landscapes and vernacular or other living traditions. The Living Dimension is one of the most important aspects of cultural heritage especially relevant to the rich civilizations in South Asia. The living heritage approach takes into consideration risks to the continuation and evolution of cultural heritage in terms of usage patterns and crafts/skills to meet changing needs and socio-economic context. Such an approach will also provide an important interface for bringing together cultural resource management, disaster management and development challenges.

5.3 The Paradigm of 'Risk Preparedness for Living Cultural Heritage'[6]

First and foremost, this implies that instead of

[6] The author has been involved in developing training kit on 'Risk Preparedness for Cultural Heritage' in his capacity as an independent consultant to the International Centre for the Preservation and Restoration of Cultural Property (ICCROM) since January 2003. The kit was recently tested in a training course held in Delhi from 16th to 20th Marach 2004. The course was organized by ICCROM in cooperation with Archaeological Survey of India (ASI).

hazard we put local knowledge and capacity in the centre. Cultural heritage is no longer representative of the dead remains from the past but symbolises the local knowledge and capacity developed indigenously by the local community over time, based on their own personal / collective experience.

Moreover, the integrated risk preparedness for living cultural heritage will involve:

- Community preparedness through awareness and training.
- Environmental management (this also involves efforts in preventing natural hazards themselves).
- Mitigating risks to built heritage (physical fabric) through physical interventions.

6. IMPLICATIONS AND CONCLUSIONS

Following implications and conclusions can be drawn from the discussion that has been initiated in this paper:-

- Integrated Framework for Risk Management implies addressing larger forces (and not merely hazards), which put cultural heritage at risk.

- It implies proactive (and not merely reactive) approach, which implies not only reacting to the risks from disaster but also addressing the underlying causes, which create the disaster itself in pre as well as post disaster situation.

- "Risks are a shared reality – spanning individual, village, block, district, state, nation and even region – and have to be responded with a multi-prong approach. "In the complex Indian reality, it also implies involving diverse group of stakeholders and integrating their concern in the overall policy initiatives. Considering the complexity of cultural heritage both in its scope and nature as well as the present reality, there can be no single policy initiative to address risks to cultural heritage. Rather, there have to be multiple initiatives at various administrative levels through involvement of multiple stakeholders (public as well as private). This requires a dialogue and subsequent collaboration and coordination.

- Risk preparedness initiatives for cultural heritage can be strengthened by integrating the concerns / needs for living heritage in the existing disaster management systems at national and state level. This requires re-addressing existing development policies and their impact on the risks to cultural heritage.

- It implies establishing / strengthening the management systems of both tangible and intangible, 'historical' and 'living' dimensions of our cultural sites and properties and establishing systems which address risks to the site and property in an integrated manner through preparedness before, during and after disaster situations. After all, integrated risk management of living cultural heritage is about addressing the knowledge and skills accumulated in the past, surviving in some form in the present with a potential for reducing disaster vulnerability and increasing capacity for the future. It is about managing the change in order to link past, present and future■

rohitjigyasu72@yahoo.com

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