Review Article

Cultural Heritage in Earthquake Prone Areas - Changing Paradigms

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OVERVIEW

Under the current `euro-centric` paradigm of conservation in India2, the definition of cultural heritage is monument centred limiting to select buildings which are supposed to be protected like dead museum pieces. In earthquake affected areas, the impact on the cultural heritage is simplified as mere physical destruction of these select monuments due to earthquake. So the only measures conceived are the technical ones i.e repairs and retrofitting to be carried out immediately following the event. Moreover, for retrofitting, the `earthquake resistant technology' is conceived as a set technical package consciously designed, standardized and imported with the only aim to resist future earthquakes. Most of the existing practices for earthquake mitigation and planning are rather shaped by this 'techno-centric' and externally operated 'instrumental' paradigm based on objectivist, positivist, determinist and reductionism assumptions of logical empiricism. However 'cultural heritage' is identified not just by select dead monuments which are mere 'representative' spatial and materialistic entities. Rather it includes a whole range of components of living built heritage, which are products of people, place and time characterized by complex ecological relationships (a multitude of systems). These are under continuous process of evolution, always updating and changing in response to various situations which are taken as part of learning processses through local initiatives. The internal worldviews / perceptions dictate these learning processes and communication mechanisms that develop over time leading to creation, reception and accumulation of new knowledge. Our comprehensive understanding of cultural heritage takes us away from the existing notions. The scope of built heritage is extended to include numerous other components and most importantly, vernacular housing. Moreover, in the new paradigm, built heritage is perceived not just as a static mechanical entity. Rather, it is very dynamic, a result of a continuous process inherently linked to the local social, economic and cultural patterns.

In disaster prone areas, natural disasters such as earthquakes are very much part of the basis of the local learning experience through series of trials and errors which thereby get understood and acted upon. Essentially this whole process itself is internalized and operates in a well-established context. Moreover, there exists a delicate balance in the way people interact with their immediate environment of which earthquakes are an inherent part and this gets reflected in the way their built form evolves over time. However it needs to be emphasized that human memory is short in the long historic continuum and as a result the lessons learnt from each event (earthquake, in this case) slowly die away and the transformation processes that follow actually lead to degeneration of the traditional technology, which makes these more vulnerable to future earthquakes. But the lessons learnt survive in traces or in whole in the built heritage.As such, components of built heritage are very much surviving documents of this complex process.

It leads us to search for 'another paradigm' which is embedded in local cultural context and is characterised by various spatial, temporal and experiential dimensions7. Such a paradigm is holistic in nature where 'interlinkages' governing social, economic and cultural eco-systems are more important than 'sectorial' knowledge. The 'dynamic process' is emphasised rather than the 'product' and in this way due consideration is given to 'cultural continuity' rather than mere 'cultural artifacts'. Moreover it signifies 'human dimension' of sustainable development.

Under the new paradigm the local knowledge of a society needs to be studied in detail before any intervention is carried from outside9. Here it needs to be emphasised that this is bound to be a very long process with no set end points (targets). Any externally directed attempt (conscious or unconscious!) to temper with this process through various initiatives with set standards, targets and short term quick solutions (based on 'expertdefined' criteria) which though well intentioned may have serious implications on cultural heritage. The externally directed 'provider' approach may infact destroy beyond repair, the internal coping mechanisms and local innovative capacity to experiment and thus engage in a process of evolution of cultural heritage. This can be well illustrated through experience in Marathwada region in India10. Here human actions following the earthquake have done much more destruction to the cultural heritage of the place than theearthquake would have done by itself. As such, this can rightly be described as 'culturaldisaster'. This paper will further elaborate on the impact of the rehabilitation process on the cultural heritage, as understood in its 'wider scope and definition' and the lessons learnt from Latur experience by illustrating the local context, the rehabilitation process and the resulting issues at hand. Marathwada (Latur) Earthquake :

In the early morning hours of September 30, 1993, an earthquake of 6.3 magnitude on Ritcher Scale shook the area in the vicinity of Latur town which is approximately 500 km east of Bombay. The epicentre was approximately 40 km south of Latur close to Killari village. It left nearly 9,000 villagers dead and around 16,000 injured. In 52 villages that were most severely affected some 30,000 houses got destroyed or badly damaged. It was reported that the epicentre was in the vicinity of the confluence of two rivers, namely Terna and its lesser known tributary11. Apparently the movement was along the two faults lying in the beds of these rivers. As a result the villages in the vicinity of these rivers suffered the greatest damage.

IMPACT ON BUILT HERITAGE :

The whole Marathwada region has a long history stretching from prehistoric times. As a result, the region is rich in numerous heritage components such as forts, temples, tanks, caves, walls etc. which are surviving evidences of various time periods. However the significant part of the heritage are traditional settlements with 'vernacular housing' as an important component. This has been traditionally built using materials that are most easily available locally including stone and wood. Typically the walls are made of stone masonry sometimes more than 2 feet thick, in mud mortar with cement used only for sealing the open joints. In the villages where there are large pockets of white clayey soil the walls are predominantly made of adobe bricks made of that soil13. The most commonly found roof consists of a thick layer of soil serving primarily as roofing. The heavy water proof and insulating layer is placed on timber understructure. There is a distinct typology for the housing based on the economic and social status of thehousehold. Houses of people with well to do status are characterised by a courtyard surrounded by a colonnaded verandah followed by rooms. The front wall with dressed stone cladding and massive doorway is the characteristic feature of these houses.

As a result of the earthquake, the built heritage in this area suffered enormous damage. However the vernacular housing was the most affected. This was primarily due to heavy roofs (mud) and thick stone walls with loose bondings especially at joints. This caused huge loss of life. On the basis of quick damage assessment immediately after the earthquake, the traditional techniques of vernacular housing were doomed to be the major cause of loss of life. All the local construction practices were rejected by the 'official expert agencies'. Local people who saw their loved ones die under the heap of stone rubble also developed an acute fear for the traditional techniques as 'unsafe' for future habitation.

THE REHABILITATION PROCESS :

The initial phase of emergency rescue and relief lasted till December, 1993. In the next phase, the government evolved a rather comprehensive rehabilitation programme which was the first of its kind in India and perhaps world. This was conceived and executed with the help of a soft loan from the World Bank14. With the World Bank money, the government of Mahrashtra drew up an ambitious plan called Maharashtra Earthquake Emergency Rehabilitation Programme (MEERP). The programme had five main components namely housing, infrastructure development, economic rehabilitation, social rehabilitation, community rehabilitation and technical assistance, training and equipment. However, in this discussion, we will limit ourselves mainly to the housing component but we will evaluate its relationship with other components of the programme. This component would finance construction/ reconstruction of housing work. It is worth noting that permanent housing construction was given the first priority before any of the other components. Accordingly, the villages were divided into three categories, namely :-

i. Villages to be relocated - type 'A' Village

ii. Villages to be reconstructed in-situ -type 'B' Village

iii. Villages were repair and seismic retrofitting of existing houses will be carried out - type 'C' village.

These categories were based on certain pre-defined criteria. The villages to be relocated were those where more than 70% houses were damaged, where a certain number of deaths were reported and where the ground had black cotton soil upto a depth of metres. Where the damage was more than 70% but strata is good i.e. soil is less than metres depth, it was decided to reconstruct those villages in-situ. The 'C' category villages were decided on the basis of a detailed 'techical' survey by a team of government engineers.

On the basis of above criteria, 52 villages were relocated with essential services and infrastructure. This required construction of over 27,000 houses. The village plans were prepared by engineers in the local Town Planning office. The houses were again divided into three categories, on the basis of land-holding with the head of a particular family. Accordingly, 'A' category houses had a carpet area of 250 sq. ft. These were provided to farmers who were landless or had land upto 1 heactares. 'B' category housing of 400 sq. ft. carpet area was provided to those having landholding between 1 heactare and 7 heactare and all the big landlords having more than 7 heactare of landholding got 'C' cateogry houses of 750 sq. ft. Please note that the built up area for these houses was about 10% more than the carpet area to allow for future expansion. In the 'C' category villages, Government was supposed to provide technical assistance towards strengthening and retrofitting, through junior engineers. However, the 'technical assistance was limited to new constructions and a definite amount of money was allocated to the houses in 'C' category villages, who were supposed to carry out strengthening and retrofitting on their own. The publicity campaign was launched by the government through constructing 'Model Houses', advocating the use of RCC bands at Plinth, lintel and roof level. The Government managed to get the participation of a large number of non-governmental agencies including commercial outfits, international donor agencies, religious groups, political parties etc. in the programme. These agencies had the freedom to employ their own contractors and approve the designs. This was all organised with an understanding between the donor agencies and the government that in return the government would provide all necessary infrastructure including water, electricity and telephone connection. Long before the World Bank arrived on the scene with its first mission, much had already happened in regards to decisions regarding setting new standards and relocation for seismic safety. These new standards advocated the use of 'earthquake resistant technology' through use of cement blocks with heavy reinforcement. The donor agencies came up with variety of building technologies to demonstrate seismic resistance. These included pre-cast concrete panels, geodesic domes with ferrocement, reinforced concrete insitu, hollow concrete blocks etc. It is worth noting that almost all the agencies advocated the use of concrete.

Under the training component, Govt. took up the training programmes of masons and rural labour in 'earthquake resistant construction' and in order to make sufficient work force available to undertake massive construction activity18. It needs to be emphasized that under this component, community participation was considered as the important part of the whole process.

In the earthquake reconstruction program that has just commenced in Gujarat in the wake of the Bhuj earthquake (2001), housing is the largest and most important component. Though the scale of reconstruction in Gujarat is much larger, the housing program has a precedent in the Maharashtra Emergency Earthquake Rehabilitation Program (MEERP). The reconstruction program after the Andhra Pradesh cyclone (1996) did not include housing; instead, restoration of infrastructure was its main objective. State governments in India, which have the primary responsibility of relief and rehabilitation, did not undertake reconstruction on a large scale after the Uttarkashi (1991), Jabalpur (1997), and Chamoli (1999) earthquakes.

When housing is included as a program component, households become stakeholders. The program is evaluated in terms of provision of housing to the people rendered homeless. Housing also creates permanent assets at the household level, and reduces physical vulnerability. It is in this context that a discussion of the housing strategy in a post-disaster situation becomes important. I recently read two contributions on the Maharashtra Emergency Earthquake Rehabilitation Program (MEERP), one by Rohit Jigyasu (2001) , and the other by Alex Salazar (1998) on the Internet. Both authors have raised a number of issues from their own perspectives. In view of the long-term impact of the reconstruction program in India and other developing countries, it is important to join these issues critically.

This rejoinder advances the proposition that design and implementation of a post-disaster reconstruction program is a dynamic and flexible process. It must reflect people's priorities and aspirations, and seek a balance between conflicting pulls of affordability, technical feasibility and quality of life. It must also recognize the participants as active stakeholders, aware and conscious of their entitlements and priorities, rather than passive recipients, who need to be educated. Further, the received wisdom is most often inadequate in dealing with the extremely complex human and spatial problems in the wake of a disaster. Actual experiences of recovery and rehabilitation may be very different from the textbook prescriptions. An objective assessment of these experiences therefore enhances our understanding of the processes that

characterize decision-making, implementation and participation in a post-disaster situation.

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