

FROM NATURAL TO CULTURAL DISASTER: Consequences of the Post-earthquake Rehabilitation Process on the Cultural Heritage in Marathwada Region, India

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CULTURAL HERITAGE IN EARTHQUAKE PRONE AREAS - CHANGING PARADIGMS :

Under the current 'euro-centric' paradigm of conservation in India¹, the definition of cultural heritage is monument centred, limited to select buildings, which are supposed to be protected like dead museum pieces. The impact of earthquakes on the cultural heritage is seen in terms of mere physical destruction of these select monuments. So the only mitigation measures conceived are technical ones i.e repairs and retrofitting to be carried out immediately following the event. Moreover, for retrofitting, the 'earthquake resistant technology' is consciously designed, standardised and imported to resist future earthquakes. Most existing practices for earthquake mitigation and planning are shaped by this 'techno-centric' and externally operated 'instrumental' paradigm based on objectivist, positivist, determinist and reductionist 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 time² characterised by complex ecological relationships (a multitude of systems). These are continuously evolving, always updating and changing in response to various situations which are taken as part of learning processes through local initiatives. The internal worldviews / perceptions dictate that these learning processes and communication mechanisms develop over time, leading to creation, reception and accumulation of new knowledge.

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¹ We can still carry on with our colonial legacy. This can be rightly said for the 'Ancient Monuments Act' which is the official legislation for the protection of built heritage in India.

² Nalini Thakur, 'Building Knowledge through a Holistic Approach towards Architectural Education and Research', 1998.

Such a 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. 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 internalised 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. However, it needs to be emphasised that the 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 improved 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.

This leads us to search for 'another paradigm' which is embedded in local cultural context and is characterised by various spatial, temporal and experiential dimensions. Such a paradigm is holistic in nature where 'inter-linkages' governing social, economic and cultural eco-systems are more important than 'sectarian' knowledge. 'Dynamic process' is emphasised rather than the 'product' and in this way due consideration is given to 'cultural continuity' rather than mere 'cultural artefacts'. Moreover it signifies the '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 made from outside³. Here it needs to be emphasised that this is bound to be a very long process with no set end points

³ The kind of traditional knowledge! With whom it resides? How it is used? Who controls it? Who executes it? What is the process of execution? How is it managed? What are the traditional management processes'?

(targets). Any externally directed attempt (conscious or unconscious!) to temper this process through various initiatives with set standards, targets and short term quick solutions (based on 'expert-defined' criteria) which though well intentioned may have serious implications on cultural heritage. The externally directed 'provider' approach may in fact 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 India⁴. Here human actions following the earthquake have done much more destruction to the cultural heritage of the place than the earthquake would have done by itself. As such, this can rightly be described as 'cultural disaster'. 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 resulting issues.

MARATHWADA (LATUR) EARTHQUAKE

In the early morning hours of September 30, 1993, an earthquake of Magnitude 6.3 on Richter Scale shook the area in the vicinity of Latur, 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 16,000 injured. In 52 villages that were most severely affected, some 30,000 houses were destroyed or badly damaged.

It was reported that the epicentre was in the vicinity of the confluence of two rivers, namely the Terna and its lesser known tributary. Apparently ground 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 structures such as forts, temples, tanks, caves, walls etc. which are surviving evidences of various time periods. However the most 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 600 mm thick, with mud mortar. Cement is used only for sealing the open joints. In the villages where there are large pockets of white clayey soil, walls are predominantly made of adobe bricks from that soil. The most commonly found roof consists of a thick layer of soil serving primarily as roofing. A heavy water-proof and insulating layer is placed on timber under-structure. There is a distinct typology for the housing based on the economic and social status of the household. Houses of people with well-to-do status are characterised by a courtyard surrounded

by a colonnaded verandah in front of rooms. A front wall with dressed stone cladding and a massive doorway are other characteristic features of these houses.

As a result of the earthquake, the built heritage in this area suffered enormous damage. Vernacular housing was the most affected. This was primarily due to heavy roofs (mud) and thick stone walls with weak bonding, 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 deemed to be the major cause of loss of life. All 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. The traditional techniques were considered to be '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. This was conceived and executed with the help of a soft loan from the World Bank. With the World Bank money, the government of Maharashtra drew up an ambitious plan called the Maharashtra Earthquake Emergency Rehabilitation Programme (MEERP). It had five main components; namely, housing, infrastructure development, economic rehabilitation, social rehabilitation, community rehabilitation and technical assistance, training and equipment.

In this discussion, we will limit ourselves mainly to the housing component but 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' Villages
- ii. Villages to be reconstructed in-situ -type 'B' Villages
- iii. Villages where repair and seismic retrofitting of existing houses will be carried out - type 'C' villages.

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 up to a depth of 2 metres. Where the damage was more than 70% but the strata was good i.e. soil is less than 2 metres depth, it was decided to reconstruct those villages in-situ. The 'C' category villages were decided on the basis of a detailed 'technical' 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 by 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 up to 1 hectare. 'B' category housing of 400 sq. ft. carpet

⁴ The Marathwada region primarily comprises of districts of Latur and Osmanabad in Maharashtra state of west India and henceforth will be referred to as Latur area.

area was provided to those having land-holding between 1 hectare and 7 hectares and all bigger landlords having more than 7 hectare of landholding got 'C' category houses of 750 sq. ft. The built-up area for these houses was about 10% more than the carpet area to allow for future expansion. In 'C' category villages, the 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 that were supposed to carry out strengthening and retrofitting on their own. A publicity campaign was launched by the Government through constructing 'Model Houses', which advocated the use of reinforced concrete bands at plinth, lintel and roof level.

The Government managed to get the participation of a large number of non-governmental agencies, including commercial firms, international donor agencies, religious groups, political parties etc. in the programme. These agencies had the freedom to employ their own contractors and approve 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 connections.

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, in-situ reinforced concrete, hollow concrete blocks etc. It is worth noting that almost all the agencies advocated the use of concrete.

Under the training component, the Government initiated the training programmes of masons and rural labour in 'earthquake resistant construction' in order to make sufficient work force available to undertake the massive construction activity. Under this component, community participation was considered an important part of the whole process.

Seven years after - the current status and consequent issues :

At present (2000), the 'rehabilitation process' is nearing completion. Construction is complete in most of the 'A' and 'B' category villages and people have moved in. While in a few villages, people moved in as early as 1995, other villages have just been occupied. So at present, these relocated and reconstructed villages present the habitation process in various stages and it is interesting to study processes initiated since then. Similarly the 'C' category villages are worth an evaluation of the status of 'strengthening and retrofitting measures'. Besides considering villages affected by earthquake, it is also worth looking at traditional villages to analyse inherent transformation processes due to various social, political and economic factors. Here, we are not looking at mere physical changes but also the social, economic and political dynamics that have caused them.

After that, we will analyse the impact on these processes on the cultural heritage of the place in its broader understanding, and evaluate its vulnerability in future earthquakes.

There are some shocking observations. First of all, in-situ reconstruction of 'B' category villages never took place. In fact, all 15 villages, which were supposed to be reconstructed in-situ got relocated. This was due to misperceptions in the local communities that their sites were unsafe in earthquakes. Wrong signals were sent out through the decision to relocate. Actually, even the established criteria for relocation is in doubt, since many of the villages, which were originally located on black cotton soil suffered much less damage than others as a result of earthquake.

Considering relocated villages, in most of them it is fascinating to see how villagers on their own have initiated changes and additions to the physical fabric that was tailor-made for them. We notice different changes in house structure e.g. addition of rooms, outdoor kitchen, courtyards, access points. However, the most noteworthy is the change in materials. Hardly any of the villagers have used reinforced concrete (except for those who are very well off). Some have used bricks, but most have used corrugated tin sheets, even bamboo / twigs. In many of these houses, people have used salvaged materials from their old houses. These include their beautiful front doorways, dressed stone masonry and in some places, wooden beams and columns (though in most cases, these are being sold or used as firewood). Such processes present an interesting case of how people adapt and also change the surroundings to suit their 'way of life' (which in this case is essentially agrarian). Most interestingly, after initial hesitation, people revert back to traditional techniques, especially stone masonry for boundary walls and at some places for house walls up to sill level. In spite of all the changes, people still maintain religious associations with their old village sites through daily visits to temples.

However, in spite of the processes of settling into their new habitat, relocated people have no dearth of problems, most of which are the result of relocation itself. First and foremost, it is important to understand that traditional villages are surrounded by their agricultural land, and the whole rural ecology is sustained on this delicate relationship of people to the natural resources around them. Unfortunately, the relocation was done on agricultural land acquired from other villages. As a result, some of the relocated villages, either lost their land to relocation for other villages (thus becoming landless forever, even though some financial compensation was offered to them), or were themselves located far off from their own agricultural lands, sometimes more than 5 kilometres.

Besides this, the spatial plans for the relocated villages were totally incompatible with 'way of life' of the villagers. Traditional settlements were characterised by narrow streets, a hierarchy of public and private open spaces used for religious as well as other activities, clusters of housing with distinct typologies characterised by traditional occupation pattern etc. What was designed for them was a complete 'city-like' plan with wide streets forming grid a pattern, and row housing. The 'designers' sitting in the town planning office perceived that 'city-like' planning would ensure 'development' of 'backward' rural areas.

In the new designs, there were no spaces for several traditional activities, especially those of service sector people like artisans. Moreover, the new villages were many-fold larger in area than the old ones (up to 10 times larger). This meant expensive infrastructure, which was again 'provided' by the Government. The lack of village committees' financial resources to maintain this huge infrastructure in the future was not thought through. Also criteria of house allocation on the basis of size of land-holdings has created new 'economic disparities' and completely destroyed the traditional social system based on 'neighbourhood units' and 'dependencies that ensured mutual sustainability'. In some cases, people vacated their allotted houses and moved back to their family members / neighbours by initiating house-extensions. As a result of house allotment criteria, traditional artisans suffered the most. Since the house allotment criteria was based on total landholding, and traditionally the artisans are believed to act as a support system for the village and not supposed to cultivate their land, they remain landless or as marginalised farmers. As a result, the houses occupied by artisans are smallest. So there is no space for them to carry out their activities.

The house designs were also very urban, with no link to people's traditional life-style. An interesting example of this is the provision of attached toilets in houses. Traditionally, these people are not even used to having toilets (they use the fields). Now we find these toilets being used to store grain. The appreciable efforts of some agencies/individuals such as HUDCO (Housing and Urban Development Corporation) towards incorporating traditional patterns in the new village-plan do need to be mentioned. However, in all these efforts there was little or no involvement of the locals in the process. The attitude was that of 'adoption and provision' rather than 'facilitation'. This made villagers dependent and raised their expectations.

Comment is needed on the quality of new 'earthquake resistant' construction in these villages. In most, leaking / dampness was occurring though porous concrete blocks without proper pointing. However, the most serious problem was development of 'through cracks' in some houses due to a later earthquake of mild intensity (Richter Magnitude 4) in June 2000. In one village, Rebe Chincholi, people vacated some of these houses out of fear. If such a moderate intensity earthquake can do such damage, then one can imagine the consequences of an earthquake equal in intensity of the 1993 quake. Had these been traditional houses, people would have had the possibility of finding a courtyard to escape into, but the modern designs have a single entry and exit. Therefore, in spite of people's extraordinary capacity to adapt to the environment over time, 'relocation' in some situations might have increased their vulnerability.

As a consequence of the above, another very interesting trend is now being seen. In one village, Syyed Hipparga, people have decided to vacate the relocated village and move back to their old site. In fact, people have started to clear the old site of vegetation and started to re-construct their old houses employing traditional techniques in their entirety. Unfortunately, they are again not employing any 'earthquake-resistant' features in their new 'traditional' constructions. So again, all the efforts of the Government and various NGOs towards 'information dissemination' and 'technology transfer' are wasted. We are back to square one.

Now consider what happened in 'C' category villages, where strengthening and retrofitting of existing houses were to take place. As a matter of fact, no one died and not much physical destruction happened in most of these villages. Some were beautiful traditional settlements with long historical continuity and various heritage components such as fortress houses, fortifications and water structures besides vernacular housing. As the Government was so much involved with new construction, measures such as repairs, strengthening and retrofitting were the least priority. There was little technical assistance forthcoming and these people were simply provided with money and were expected to carry out these measures on their own. For each village two junior engineers were allocated by the government to provide technical assistance. However, these engineers, trained in 'western' education, perceived traditional housing to be 'outdated' and 'weak', and thus strongly advocated local people to vacate them and build 'modern' housing in brick and concrete. Poor villagers who had suffered great trauma were too scared to risk their lives in any way and thus submitted to the 'expert' views of these engineers who also played an important role in strengthening the perception of local people against the use of stones and wood. It is interesting that 'wood' was perceived unsuitable for construction, while in reality, wood-framed structures behave quite well in earthquakes. As a result, most of these villages were slowly vacated and people demolished their own houses and sold well-dressed stone blocks and wooden beams and columns at petty prices. They started settling down just outside the old village and used the money allocated by the government to construct new houses. With the little money they got, they could hardly afford to construct one or two rooms in poor quality bricks in mud mortar and corrugated tin sheets for roofing. Besides being of poor quality, they are totally unsuitable for the local climate. Tin sheets get oven hot during hot summer days. Traditional mud roofs kept inside temperature cool enough, so that even fans were not required. The new houses are also much more vulnerable to earthquake.

It is indeed ironical, how actions of 'experts' turned this 'natural' disaster into one of the biggest 'cultural' disasters that the country has witnessed after independence. So strong were perceptions against the use of traditional technology and materials that people demolished age-old temples of finest stone and wood carvings, and made imitations in concrete. This still continues though they could hardly afford the use of concrete due to expensive cement and scarcity of water, thereby resulting in very poor construction quality which vulnerable to earthquakes. Some of the 'modern' reconstructed temples and other public buildings have cracked and have seeping water.

An NGO named ASAG, Latur unit (Ahmedabad Study Action Group), in spite of various difficulties, actually demonstrated innovative techniques in 'strengthening and retrofitting'. ASAG along with some other NGOs actively got involved in 'information dissemination on simple repairs and retrofitting techniques' to the villagers right from the early stages. They were also actively involved in initiating mason training programmes as well as construction of model houses. However, in spite of the sincere and persistent efforts of these NGOs, not much difference could be seen in the overall situation.

Finally, consider the status of the ten 'Building Centres' in Latur and Osmanabad supported by HUDCO (Housing and Urban Development Corporation) and also assisted by the Government. These centres were supposed to promote construction activity and generate employment through training programmes for construction artisans, unskilled labour and unemployed youth. The centres supplied building materials to construction sites and educated people with respect to earthquake resistant technology. This was a very good idea and would have ensured sustainability. Unfortunately, at present all these ten centres have been shut down for three to four years. Today, they appear like ruins, with unfinished concrete blocks, dry tanks and rusted machines. Why did this happen? There are several reasons. Firstly, the technology, which was supposed to be inculcated was alien and unsustainable. Secondly, the centres were established through outside financial resources without a proper management plan for internalising the whole process with the local community. Thirdly, there was considerably less involvement of traditional artisans, who were made to neglect their existing skills and made to learn something totally outside their previous experience. 'Earthquake resistant technology' was taught as rigid design packages, without any scope for experimentation.

Traditional artisans are the carriers of cultural heritage. Ironically, they were the greatest sufferers of this rehabilitation process. They have not only suffered economically, but rehabilitation has adversely affected their workmanship and skills. In this rehabilitation programme, there lies no provision or policy measures for rehabilitating the local artisans apart from distribution of 'tool kits'. But what will tools do, if there is no work? The criteria for house allotment and how it adversely affected the artisans has already been discussed. In the entire programme, traditional carpenters and stone cutters were hardly employed since little wood and very little stone was being used. Fear of traditional techniques has further aggravated their plight. All this has been the death knell to already disappearing living building craft traditions, and many of the traditional craftsmen have changed their occupations.

Is traditional building technology 'good' or 'bad' for earthquakes? It is true that most of the loss of life was due to poor bonding of stone pieces behind the facade of nicely dressed stones. Also it is true that extremely heavy mud roofs caused total collapse of structures. But before we start to totally reject traditional technology we need to look back into historical time period and look at the traces of surviving built heritage. We find the finest specimens of stone masonry with 'through' stones (sometimes without any mortar), strong corner joints and adobe construction in white clay and wooden framed structures. To some extent traditional technology has degenerated mainly due to poverty. Evidence of this is also seen in traditional settlements, which are not affected by earthquake. Behind nice front facades, the original built form of high quality has deteriorated to a very poor state due to years of neglect and alterations. Ironically, while totally rejecting traditional technology, what is offered in its place is something, which is totally un-sustainable due to the inability of actual users to afford it.

LESSONS TO BE LEARNT

The rehabilitation process is complete and we have seen its consequences. It is time to learn some lessons for future disaster management measures in general, and cultural resource management in earthquake prone areas in particular.

First, we need to change the current education system in India, which is totally alien to our cultural context. This is very important since peoples' perceptions are based on knowledge, which is shaped by educational background. In the process of standardising everything, we have forgotten to train ourselves in 'thinking processes' rooted in cultural traditions. We tend to look at everything as 'static' and 'uniform' and perceive 'tailor-made' solutions. We have started to take everything for granted and are losing out on 'creativity' to experiment and evolve. This applies to 'cultural heritage', which has stopped being innovative. We have also lost pride and confidence in ourselves, and consider anything which is 'western' and 'modern' as better than what we possess. In fact, our notions of 'development' are also shaped by this perception. What we really need is to pick up the thread on our own and decide our future course of action. Those who are outside the society can only help with resources but the local institutions (which are truly representative of the society itself) need to know what, where and how to use these resources. People have an extraordinary capacity to adapt to changing situations and devise ingenious solutions. However, these need time. It is a slow process and one cannot expect miracles to happen. Just as local communities take earthquakes as part of their learning experience over time, 'disaster-management' has to be looked as part of long term development process of a community.

Then there are lessons regarding 'technology transfer' and 'information dissemination'. We learn from the Latur experience that we cannot impose 'earthquake resistant technology' as set design packages. Improvements have to take their own slow course of being internalised within the existing traditional building knowledge, and the whole process of adaptation has to be done by the local community itself. Outsiders can only be facilitators in the whole process with their resources and ideas. It needs to be understood that traditional building knowledge is most sustainable since it utilises local resources to the optimum and such delicate traditional eco-systems need to be intervened with utmost caution. Also, professionals have to look outside their narrow shell of 'expertise' and be aware of implications of their suggestions. 'Sectarian expert knowledge' has to complement the 'holistic local knowledge', and this needs better communication between the two sides.

Thirdly, there is a problem of trying to attack visible effects rather than tackling the root causes which cause vulnerability. There are more immediate problems for our society in India, and earthquake preparedness is not perceived by the community as an issue of priority. This has resulted in failure in generating awareness to prepare against earthquakes. These problems also result in a fast dwindling cultural heritage and make it more vulnerable to natural hazards such as earthquakes. Therefore, rather than just concentrating on rigid solutions of strengthening and retrofitting (which will not serve their purpose in the absence of the ability of the users to undertake proper care and maintenance), the root causes of vulnerability must be solved.

Lastly, cultural heritage is a product of local life-styles, which again are a result of traditional occupational pattern, social dependencies and local beliefs and practices. These carry the essence of a living heritage and as such need to be considered in their entirety rather than just concentrating on built aspects of heritage which are mere physical entities. Local people, especially traditional artisans, are the true bearers of this heritage and their interests should be given due

consideration, not just by preserving their crafts, but also enabling them to creatively evolve them according to changing situations. We need to preserve cultural heritage through reinforcing its evolutionary progress.