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Title of the Paper :

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

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¹ The author is undertaking research titled 'Holistic Eco-developmental knowledge for reducing vulnerability of Traditional Settlements against earthquakes in South Asia '. The research seeks to explore local skills and capacities of traditional rural societies that have potential of prevention / mitigation against earthquakes. It also looks at the transformation processes behind increasing vulnerability of traditional rural settlements in South Asia. The existing gap between the 'traditional' knowledge and the 'expert' knowledge in disaster planning and management and its consequences on mitigation against earthquakes is brought forward. The two case study areas for detailed study are Marathwada region (Latur and Osmanabad districts) in India and Kathmandu valley in Nepal .

Cultural Heritage in Earthquake prone areas - changing paradigms :

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, standardised 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 reductionist assumptions of logical empiricism³.

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 time⁴ characterised by complex ecological relationships (a multitude of systems)⁵. These are under continuous process of evolution, 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 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

² We 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.

³ In philosophical terms, this externally operated paradigm assumes separateness: 'observer' from the 'observed', 'man' from 'nature', 'mind' from 'matter', 'science' from 'religion', of fundamental particles from each other, of the different parts of an organism from each other and specialisation of different scientific disciplines. The knowledge is based on putting together parts to make the whole.(S.C. Malik)

⁴ Cultural heritage is the physical expression of the ethos of an identifiable culture at a specific time; a product of the community's perception and priorities. The variety of combinations, interactions of great complexity culminate in an identifiable culture with specific norms, traditions, attitudes and perceptions (Nalini Thakur, 'Holistic perspective for Architectural Conservation in India', 1993)

⁵ The concept of ecological planning is 'holistic' and 'territorial' in its conception and is 'value driven' striving towards equity, sustainable development and building civic society. The author acknowledges the efforts of Prof. Hans Christie Bjonness who has been instrumental in developing the course in 'Urban Ecological Planning' at the Deptt. of Town and Regional Planning at NTNU. He is also the main supervisor for the doctoral studies of the author.

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 and this gets reflected in the way their built form evolves over time. However it needs to be emphasised 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 earthquakes⁶. 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 development⁸.

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 '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 India¹⁰. 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

⁶ This is especially true in the areas where earthquakes occur after long intervals. On the other hand, higher frequency of occurrence of earthquakes in areas such as Japan probably allowed innovations to be attempted several times within a conceivable life time.

⁷ Such a paradigm is rooted in eastern philosophical traditions. The experiential aspects look at human being as a part of the whole, called by us 'universe', a part limited in time and space. The nature is perceived as an evolving eco-system of which human species are a part. The notions of space are symbolic which link microcosm to macrocosm. The notions of time are cyclic, based on rhythms and processes that overlap one another like intersecting circles or a spiral mobile.

⁸ Human dimension of development had been foresighted by Mahatma Gandhi. He advocated true grass root democracy based on his true historical cultural understanding of self sufficient 'village republics' in south asian context. It is ironical that in his own country, we have moved away from his futuristic vision.

⁹ The kind of traditional knowledge! With whom it resides? How it is used? Who controls? Who executes? What is the process of execution? How is it managed? What are the traditional management processes?

¹⁰ 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.

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 the resulting issues at hand.

Marathwada (Latur) Earthquake :

In the early morning hours of September 30, 1993, an earthquake of 6.3 magnitude on Richter 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 times¹². 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 the

¹¹ It is worth noting that historically settlements have always been located along the rivers as these were the main modes of communication. In this context, Terna river holds very important significance as along its banks is located a village named Ter, which had immense significance as a Trade Town during the reign of Satvahanas. Trade was also carried out with Greeks as some archaeological findings illustrate clearly.

¹² Chronologically history speaks of association of this land with Satvahans, Vakatakas, early Rashkutas, Vishnukundins, Kalachuris, Chalukyas of Badami (6th cent.AD), Rashtrakutas, later Chalukyas, Yadavas of Devgiri (12th cent. AD), Delhi Sultans (Medieval period, 1317), Bahamanis, Nizam Shahi, Adil Shahi & Barid Shahi Kingdoms, Moghuls, Nizams of Hyderabad.

¹³ Some of the finest specimens of adobe bricks are found in some villages like Kharosa, Ter etc. These were made using special techniques of continuous ramming of 'white' soil and mixing it with hay etc. The exact technique has unfortunately got lost. Some of the very fine specimens of adobe bricks even float on water. These houses performed very well during 1993 earthquake.

household. 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 Maharashtra 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 equipment¹⁵.

¹⁴ Although immediately after the quake, the government had estimated the cost of rehabilitation at around Rs.2 billion, the programme budget at the onset stood at Rs. 12 billion. During its execution it went up by another 15%. The world Bank sanctioned a low interest emergency loan with a 10-year moratorium and 30 year payback period of Rs. 9.5 billion.

¹⁵ The infrastructure component covered reconstruction, repair and strengthening of public buildings and infrastructure and the improvement of transit shelters. The activities covered under the 'social rehabilitation' component included provision for special facilities and activities to address the needs of women and children affected by the earthquake, and improvement/restoration of social facilities such as age old homes, child care centres, district trauma centres, homes for handicapped, community centres for women etc. Towards economic rehabilitation th programme had made provision for repairs/reconstruction of dug wells, replacement of bullocks, replacement of major and minor farm implements, replacement of cattle and rehabilitation of artisans and small business persons. The component of community rehabilitation covered the cost of works and materials required to re-establish essential services such as medical services, construction and provision of services for temporary transit shelters.

As part of MEERP, one of the mandated activities of the Govt. of Maharashtra is the preparation of a comprehensive multi-hazard Disaster Management Plan for the state of Maharashtra. The World Bank, UNDP and DFID (Deptt. for International development, UK) are supporting different complementary components of this muti-faceted effort. It is an ambitious plan, with emphasis on disaster management response, disaster awareness and education. It has a state plan as the core and all the district plans of Maharashtra forming the superstructure.

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 2 metres¹⁶. Where the damage was more than 70% but strata is 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 office¹⁷. 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 hectare. 'B' category housing of 400 sq. ft. carpet area was provided to those having landholding between 1 hectare and 7 hectare and all the big landlords having more than 7 hectare of landholding got 'C' category 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

¹⁶ Those sites which were selected were approved by Geological Survey of India after considering that there are no main fractures inside on the basis of satellite imagery.

¹⁷ As desired by the world bank, the plans were supposed to be prepared in consultation with the villagers. However in practices, there was no consultation, rather these were just shown to the local gram sabha (village committee) and sought their consent for the name-sake. (source-interviews with villagers)

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 emphasised that under this component, community participation was considered as the important part of the whole process.

Seven years after - the current status and consequent issues :

At present in the year 2000, the 'rehabilitation process' is nearing completion¹⁹. The construction is complete in most of the 'A' and 'B' category villages and people have moved in them. While in a few villages, people moved in as early as 1995, in the others people have just occupied. So at present these relocated and reconstructed villages present the habitation process in various stages and it is interesting to study the processes initiated since then. Similarly the 'C' category villages are worth having a look to evaluate the status of 'strengthening and retrofitting measures'. Besides having a look at the villages affected by earthquake, it is also worth looking at the traditional villages to analyse inherent transformation processes that are going due to various social, political and economic factors. Here I would like to mention that we are not looking at mere physical changes but also the social, economic and political dynamics that have caused these. After that, we will analyse the impact on these processes on the cultural heritage of the place in its broader understanding and evaluate the status of vulnerability against future earthquakes.

¹⁸ Around 900 masons and 2800 labour were trained in 20 centres in Latur district with the help of voluntary training officer through paying petty daily allowance. However this was only an initial activity limited for one year.

¹⁹ According to the status report of MEERP in February 2000 by PMU, Mumbai, 27,861 (99.50%) houses are completed and 83 (0.5%) houses under various stages of progress out of a total of 27,944 houses. 31 donor agencies took up construction of 8,434 houses, and have completed the same. Govt. undertook the construction of the remaining 19,510 houses and have completed 19,427 houses. Under Repair and Strengthening programme, out of 2,01,134 houses, 1,99,207 have been completed and 1,040 houses are in progress. (it is a different matter if in all these houses actual repair and strengthening ever took place or they were constructed anew),

There are some shocking observations. First of all, insitu reconstruction ('B' category villages) never took place. Infact, all 15 villages which were supposed to be reconstructed in situ got relocated. This was due to mis-perceptions that developed in the local communities that their site was unsafe from earthquakes. This in turn was because of wrong signals sent out through relocation. 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 as a result of earthquake.

Anyhow, coming back to relocated villages, in most of them it is fascinating to see how villagers on their own have initiated changes and additions in 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 RCC (except for those who are very well off). Some have used bricks but most have used corrugated tin sheets. Somewhere we find use of bamboos / 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, how people adapt themselves and also change the surroundings to suit their 'way of life' (which in this case is essentially agrarian). Most interestingly, after initial hesitation, we find people now reverting back to traditonal techniques especially stone masonry for boundary walls and at some places for walls upto sill level. Here I will like to mention that inspite of gradual consolidation, people still maintain religious association with their old village sites through daily visits to temples.

However, inspite of the processes of stabilising in their new habitat, the 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 traditionally the villages are surrounded by agricultural land belonging to them and the whole rural ecology is sustained on this delicate relationship of man to the natural resources around him. However, 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 or were themselves located far off from their own agricultural lands, sometimes more than 5 kilometers. On the other hand, some of the people in traditional villages lost their land to relocation for other villages, thus becoming landless forever (no- matter some financial compensation was offered to them).

Besides this, the spatial plans for the relocated villages were totally incompatible to their 'way of life'. The traditional settlements were characterised by narrow streets, 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. However, what was designed for them was a complete 'city-like' structure with wide streets forming grid iron pattern and row housing. The 'designers' sitting in the town

planning office perceived that 'city-like' planning will ensure 'development' of 'backward' rural areas.

Interestingly, in the new set up, there were no spaces for several traditional activities especially those of service sector like artisans. Moreover the new villages were many-fold larger in area than their old ones (sometimes even 10 times). This meant heavy cost of infrastructure, which was again 'provided' by the government. What was not thought of was the lack of financial resources with the village committee to maintain this huge infrastructure in the future²⁰. Moreover, the 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'²¹. Even some joint families got divided in different classes. Interestingly in some cases, I found people vacating their allotted houses and moving back to their family members / neighbours by initiating house-extensions. Moreover, as a result of house allotment criteria, traditional artisans²² suffered the most. Since the house allotment criteria was based on total landholding and traditionally artisans are believed to act as a support system for the village and they are not supposed to cultivate their land, hence the artisans remain landless or as marginalised farmers. As a result, the houses which the artisans have got are smallest one where there is no space them to carry out their activities.

The house designs were also very urban with no link with their traditional life-style. An interesting example of this is the provision of attached toilets in these houses, whereas traditionally these people are not even used to having toilets in their houses (they use the fields). Interestingly now we find that these toilets are being used to store grains. However, at this point it will not be wise of me, not to mention appreciable efforts of some agencies/individuals towards incorporating traditional pattern in the new village-plan²³. However in all these efforts, there was little or no involvement of the locals in the

²⁰ This has been a source of great difficulty now since the local village committee had to increase taxes to cover the costs for maintenance of this infrastructure and the poor villagers are unable to afford it. e.g. in one village (Jewli), the poorest who had to earlier pay Rs. 135 per house per year are now made to pay Rs. 1200/-. However due to their inability, only 10 to 13% of estimated revenue is being collected.

²¹ Here one may get oneself doubting the relevance of traditional social structure which is characterised by caste system. This system, with its innumerable divisions, as we know it, did not exist earlier. There were only 4 divisions and they were based on different occupations meant to support each other. However, interestingly none of these were decided by birth. So even a member of the lowest class, could win a throne or acquire intellectual knowledge if he was able enough. Only in later days, the Aryans degenerated and their caste system became rigid, as we find now. (Nehru, 'Glimpses of World History')

²² The traditional building artisans in this region are Sutar (carpenter, who makes unique roof pattern called 'Malwad' as well as agricultural tools), Wadars (involved in extracting and breaking the stones from quarries. He plays the vital role in stone masonry work. They make the lintel called chhawani from stone. Many times one could see the Ashlar masonry work at the facing wall), Patharwat (decorates house entrance and does other carving work in stone).

²³ Worth mentioning here is the role of HUDCO (Housing and Urban Development Corporation Ltd., India). HUDCO adopted four villages and incorporated number of traditional features like cluster planning in the new plans. Particularly interesting is the case of one village, Tembhe, where for the first time insitu-reconstruction was done on the foundations of old houses. So the whole village was recreated as it was before. Even the front facades of houses used stones salvaged from old houses. However, there are some

whole process. The whole attitude was that of 'adoption and provision' rather than 'facilitation' which made them dependent besides raising their expectations.

I also need to mention here the quality of the new 'earthquake resistant' construction in these villages. In most of the villages, I found leaking / dampness though porous concrete blocks without proper pointing. However, the most shocking was development of 'through cracks' in some houses due to a recent earthquake of mild intensity of 4 on richter scale in June 2000. In a village, Rebe Chincholi, people have vacated some of these houses out of fear. If such a moderate intensity earthquake can do such damage, then we can very well imagine the consequences of an earthquake of intensity of 1993 quake. Had these been traditional houses, people would have had the possibility of finding courtyard to escape, but with the modern designs having a single entry and exit and one room following another, we end up creating 'death traps'. Therefore, we find that inspite of people's extraordinary capacity to adapt to the environment over time and thus initiating changes, 'relocation' has done nothing more than increasing the vulnerability of the people.

However, as a consequence of the above, another very interesting trend is now being seen in one village, and I guess, it must have begun in many other villages. In a village, Sayyed Hipparga, people have decided to vacate the relocated village and move back to their old site. Infact, 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' go down the drains. This is a way completes the vicious circle and we are back to square one. We need to ask ourselves, WHY SO?

Now, let us look at 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 had happened in most of these villages, some of which like Kharosa were beautiful traditional settlements with long historical continuity resulting in various heritage components such as fortress houses (Garhis), fortifications, water structures besides vernacular housing. As the government was so much involved with new constructions, measures such as repairs, strengthening and retrofitting were things of least priority. There was little technical assistance forthcoming and these people were simply provided with some money²⁴ and were expected to carry out these measures on

problems with this approach. Except from front facades, rest of the building technology comprised of 'cement blocks', and in this way were not affordable for future changes. Moreover, the whole re-construction was tailor-made for them. However one very interesting example is that of insitu reconstruction of village Pardiwadi by one local NGO called 'Manavlok'. Here in long participation with the local villagers, the whole village has been reconstructed by the villagers themselves, with suitable changes such as widening of roads.

²⁴ Rs. 17,000/- were allocated in case of minor damage and Rs. 34,500/- in case of major damage. This was based on a quick damage assesement was done my government engineers.

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 the 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. These engineers 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 contrary to this, in reality wood-framed structures behave much better against earthquakes. As a result, slowly most of these villages were vacated and people demolished their own houses and sold out well-dressed stone blocks and wooden beams and columns at petty prices. Instead 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 that 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, these constructions are totally unsuitable for the local climate, as the tin sheets get oven hot during hot summer days while the traditional mud roofs kept inside temperature cool enough so that even fans were not required. Moreover, they are much more vulnerable to earthquake.

It is indeed ironical, how actions of 'experts' turned this 'natural' disaster into one of the biggest 'cultural' disaster that the country has witnessed after independence. So strong were these mis-perceptions against the use of traditional technology and materials that people demolished age-old temples with some finest stone and wood carvings and made their 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 quality of constructions which are much more vulnerable to earthquakes. Interestingly I found some of the 'modern' temples and other public constructions leaking and cracking.

However, here I need to mention here some sincere efforts of an NGO named ASAG, Latur unit (Ahmedabad Study Action Group), who inspite of several odds against them, actually demonstrated innovative techniques in 'strengthening and retrofitting'. It is only their utmost conviction, which enables them to carry on even now with formulating village level preparedness plans. ASAG along with some other NGOs like SPARC 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, inspite of the sincere and persistent efforts of these NGOs, not much difference could be seen in the overall situation.

Lastly, lets have a look at the status of ten 'Building Centres' in Latur and Osmanabad supported by HUDCO and also assisted with Government of India, KfW and HUDCO grant support. These centres were supposed to promote construction activity and generate employment through training programmes for construction artisans, labour and unemployed youth. These centres supplied building materials to the construction sites and

educated people with respect to earthquake resistant technology. This was a very good idea and would have ensured sustainability in the long run. Unfortunately, however at present all these ten centres have been shut down since last 3-4 years. Today these centres appear like ruins with unfinished concrete blocks, dry tanks and rusted machines. Why did this happen? There are several reasons for this. 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 totally undo their existing skills and made to learn something totally alien to their prior knowledge. The 'earthquake resistant technology' was taught like rigid design packages, without any scope of experimentation, together with local artisans.

It is traditional artisans who are the carriers of cultural heritage and ironically, these in fact were the greatest sufferers of this rehabilitation process. They have not only economically suffered, but it has adversely affected their workmanship, their skills and their source of sustenance. In this Rs. 1200 crore rehabilitation programme, there is no provision or policy measures for rehabilitating the local artisans. Only measures conceived were distribution 'tool kits' but what will these tools do, if there is no work. The criteria for house allotment and how it adversely affected the artisans has already been elaborated. In the entire programme, the traditional carpenters and stone cutters were hardly being employed since any wood and very little stone is being used. Fear of local people against traditional techniques have further aggravated their plight. All this has been death knell to already disappearing living building craft traditions and many of the traditional craftsmen have changed their occupations.

I would like to end this section by bringing in the discussion on whether traditional building technology is 'good' or 'bad' against earthquakes. True that most of the loss of life was due to poor bonding of stone pieces behind the facade of nicely dressed stones. Also true is the fact that extremely heavy mud roofs caused total collapse of structures. But before, we start to totally reject the traditional technology, we need to look back into historical time period and look at the traces of the surviving built heritage. We will find the finest specimens of stone masonry with through stones (sometimes without any mortar), strong corner joints, adobe constructions in white clay and wooden framed structures. This leads us to believe that somewhere along the historical time line, traditional technology has degenerated mainly due to poverty which again is a result of various root causes, that I will not go into²⁵. The resulting effects are also seen in traditional settlements which are not affected by earthquake, where behind the nice front

²⁵ It is noteworthy that our rural settlements are essentially agrarian in nature. In fact a lot of our built heritage owes to the agricultural practices. However years of neglect of the agricultural sector by the government (it seems to be the area of least priority against so called industrial development), the zamindari system (which though is now legally abolished, still carries on with lot of poor tenant farmers being exploited by big landowners), presence of middlemen (who are great hurdles in getting the farmers right price for their produce) and over and above all this the effects of globalisation, market capitalism and economic liberalisation (where these petty farmers are not able to stand competition from outside).

facades, we find that the original built form of high quality has transformed to a very poor state due to years of neglect, unmaintenance and sub-divisions. Ironically, while we are totally rejecting the traditional technology, what we are offering in its place is something which is totally un-sustainable due to lack of entitlement of the actual users to afford it. In a way we are making them more vulnerable to future earthquakes.

Recapitulating the Consequences - the Lessons to be learnt :-

All said and done, rehabilitation process is now over and we have seen its consequences in the long run. It is high time that we learn some lessons for future disaster management measures in general and cultural resource management in earthquake prone areas, in particular.

First and foremost we need to bring a revolutionary change in our education system, which is totally alien to our cultural context. This is very important since our perceptions are based on our knowledge which is shaped by our 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 every everything as 'static' and 'uniform' and perceive 'tailor-made' solutions. Somewhere along the line, we have started to take everything for granted and are loosing out on 'creativity' to experiment and evolve. This can be said for 'cultural heritage', which has stopped at being innovative. We have also lost pride and confidence in ourselves and that tends us to look upon anything which is 'western' and 'modern' as better than what we possess. Infact our notions of 'development' are also shaped by this perception. What we really need is to pick up 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 true representative of the society itself) need to know what, where and how to use these resources. People have extraordinary capacity to adapt to changing situations and devise ingeneous ways. However these need time as 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 also learn from Latur experience that we cannot impose 'earthquake resistant technology' as set design packages. Infact this has to take its own slow course of internalising 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 once and for all that traditional building knowledge is most sustainable since it utilises local resources to its optimum and such delicate traditional eco-systems need to be intervened with utmost caution. Also, somehow, the professionals have to look outside their narrow shell of 'expertise' and look at various implications of their suggestions. 'Sectorial 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 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. As such, we need to look into the root causes of these problems which are also resulting in the fast dwindling cultural heritage and making it more vulnerable, 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.

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 its entirety rather than just concentrating on built aspects of heritage which are mere physical entities. Moreso, local people especially the traditional artisans are the true bearers of this heritage and their interests should be given due consideration. These lie not just in preserving their crafts but also enabling them to creatively evolve them according to changing situations. We strive to preserve cultural heritage through reinforcing its evolutionary process.
