Sustainability & Plurality

in Built Environment

- a case study of RECONSTRUCTION

opportunities and barriers to a inclusive, sustainable and plural response

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1. Plurality and Sustainability in the Built Environment:

The Case-Study and its methodology

Our Built Environment (BE) is one of the strongest symbols of the current paradigm of development, and control over knowledge and resources. This field, regarded as highly specialized, has contributed substantially to environmental damage, furthering of social inequities and has remained the exclusive domain of a few, even as a variety of structures have been put up over the centuries along with many innovations by human civilisations.

Reconstruction after disasters is a part of BE and is a microcosm of the construction industry. It escalates and telescopes the issues, problems, and opportunities of the construction industry to a narrow bandwidth of space, time and resources.

Large scale disasters impact not only the homes and livelihoods of people but destroy basic services and infrastructure – power, water, transport and communications, public buildings and monuments, businesses, industries, large and small scale production units and systems and so on, in addition to neighbourhoods, communities, governance systems etc. A response to the usual scale and extent of destruction requires huge amounts of financing, designing good policies and guidelines, putting in relief and recovery measures, distribution and allocation of funds and responsibilities, co-ordination between different sectors, materials, equipment, skills … etc. The role the government plays is invaluable and is a crucial determinant of whether recovery and rehabilitation is successful or not – success being measured in the satisfaction of the affected population. Thus the consequent large-scale 'good' reconstruction process pre-supposes a strong and efficient regulatory mechanism that would enable reconstruction to be carried out with speed, efficiency, sensitivity, inclusiveness and cost-effectiveness. A variety of actors are required to make reconstruction up to the mark.

A combination of the current development paradigm and the scale of such destruction and immediate need for re-building bring in the inevitable combination of the expert, the government and the market into the arena of reconstruction; and one sees that as in normal times, the decisions of this triad dominate the outcome more often than not. Yet, reconstruction abounds with opportunities as it present a space and opportunity to dismantle that which does not work and put in place that which is more positive and desirable.

This paper contextualized itself in three major disasters in the last decade in India (the Gujarat earthquake, the Tsunami in Tamil Nadu, and the Kosi floods in Bihar) and sought to draw observations and learnings from these to broadly examine the the opportunities, barriers and challenges to pluralism, justice and sustainability and bring out the factors that are required to be included in any debate on Ethics of Science & Technology, vis-à-vis construction/ re-construction.

This paper sought to address the following key questions:

- What are the dominant, mainstream and alternative technologies and appropriate practices being used that promote a culture of sustainability, plurality, community participation and decision making in Reconstruction?
- What and who dictates the choices of approaches and technologies?
- How do these technological interventions impact the people at the ground level?
- What are the learnings and insights from the field? And how are these being applied and absorbed in the broader policy framework?

These questions are posed particularly in the background reality of people's self-sufficiency in construction and habitat development and management in ordinary times. Though many of these

were specialized functions, they were rooted in the community and in the local eco-system and resources (including knowledge). Modern science, while it has much to offer by way of materials, technologies, comforts and design, also appears to have denigrated local practices, people's methods and environmental understanding to promote alien technologies on a mass scale which is often violent in several ways.

Using the experiences and data from three disasters and the subsequent reconstruction, the paper seeks to examine whether reconstruction has eliminated plurality and how. How has it standardized materials, technologies and design and what exactly has it eliminated?

<u>Methodology adopted</u>:

The authors are practitioners and activists from this very field and have had the experience of taking alternative approaches to construction and reconstruction. For this paper, secondary data was collected and compiled including on the magnitude of materials consumed, the government guidelines and norms in each of these three disasters, notes and presentation from many civil society organizations and experts, earlier studies and published papers etc.

In addition, field visits were made to Gujarat, Tamil Nadu and Bihar and group discussions were held with affected communities. Individual case studies were compiled in addition to interviews with experts and officials.

2. Introduction: Built Environment and Reconstruction

Since humans learnt to walk upright, they have constantly engaged with their environment and tried to bring it under control, to serve them and to make their life more comfortable, safe productive and enjoyable. Once the immediate necessities of food were taken care of, attention turned to the issue of shelter and from then on began the engagement with creating, maintaining and modifying the built environment. This reason, to make life more comfortable, safe, productive and enjoyable still remains the single-most reason why we still continue to design and produce tools, modify and manipulate space, plan and shape settlements and cities.

These products and processes of human creation collectively are called the *built environment*. This term is comparatively new, but it describes in one holistic and integrated concept the creative (and not so creative) results of human activity in this arena throughout history.

Built environments have been one of the strongest mediums of power and control in society. It is a powerful determinant of who gains and who loses in the distribution and redistribution of its positive and negative impacts and has played a significant role in creating inequalities, inequities, social injustice, loss of community, loss of place identity, and a loss of spiritual dimension of life. (Warwick Fox).

> **Comment:** INCOMPLETE REFERENCE

Reconstruction: *Impetus and impact of rapid development*

Disasters, however 'natural', are profoundly discriminatory. Wherever they hit, pre-existing structures and social conditions determine that some members of the community will be less affected while others will pay a higher price.

The arena of 'Reconstruction' is a microcosm of the construction industry, reflecting and telescoping its processes and impacts in a small time-frame. While restoring basic services and life support infrastructure after a disaster can take a matter of weeks and interim reconstruction can take over a period of 3-5 years, full recovery of the communities can stretch out to 10-15 years.

The questions that emerge during the short-term reconstruction phase are: what has been destroyed? What was there before? What was the culture and ethos of the pre-disaster time? What were the lifestyles and inter-community relationships? What were the dependencies and support systems in the region? Does one try and recreate what was there before or improve on the situation? How does one build back better?

Reconstruction is also driven by other value-laden questions about equity. Who sets the priorities for recovering communities and how are the needs of poor and vulnerable evaluated and met? How are the needs of the communities valued in relation to the pressing claims of disrupted businesses and industries? Who decides what will be rebuilt where? Who gets displaced when new facilities are constructed in the name of recovery? How are local communities involved in the reconstruction? What kind construction technologies and techniques used? And so on …

Besides the social dimensions of such reconstruction and rehabilitation, there are issues relating to the environment. Every post-disaster reconstruction sees rapid and mass construction in a very short duration of time. It means unprecedented consumption of materials of different kinds in a very short time, at a rate which may not give enough time for the environment to recover and replenish. In that sense, disasters require reconstruction, reconstruction impacts the environment and environmental degradation makes the vulnerable more vulnerable.

The Gujarat earthquake affected 7904 villages in 21 districts of the state's 25 districts. It left 370,000 houses destroyed and an additional 922,000 damaged with a total estimated loss of Rs. 21,262 crores. [1]

The tsunami fully or partially damaged more than 150,000 housing units in the states of Tamil Nadu, Andhra Pradesh, Kerala and Pondicherry causing estimated damages of Rs. 994.0 crore ($228.5 million).

In Bihar, in August 2008, the flood waters caused damage across 3000 sq km of land area in five districts and about 3,40,000 dwellings were destroyed.

> The reconstruction of houses in Tamil Nadu alone has meant a consumption of 7.2 million bags of cement, 640 million number of bricks, 24 million kilos of iron/steel, 96 million cubic feet of sand and 24 million cubic feet of aggregate (metal), with a carbon footprint of 595,246 tonnes of CO_2 (6,073,000 GJ * 0.098tCO2) in a short span of 3 years.

This kind of scale of destruction and consequent reconstruction impacts people's lifestyles, environment, social fabric, not only in the short-term but in the long-term as well. Interventions and approaches introduced during reconstruction stand as examples and eventually get absorbed into the mainstream as practices. In this context, the way in which reconstruction gets implemented raises many questions and debates on issues of plurality, sustainability, justice and equity.

It is also true that questions of justice and equity have been frequently raised and addressed in reconstruction and we shall see how these are addressed (at least on paper and in intention) and how these get implemented.

Sustainability in reconstruction, as a concept, has been recognized by and large in the last few decades, but is not yet a priority. However with the debate on sustainability and environmental issues growing over the years, sustainability is beginning to be seen as an issue that needs to be addressed in reconstruction too.

Plurality, however, has hardly been seen as an aspect that needs to be addressed in reconstruction. Though there have been several debates and interventions on including traditional practices into the norms of reconstruction, plurality and its elimination have rarely been highlighted.

Knowledge Swaraj or People's self-sufficiency within the Built Environment very much exists at the grassroots. It is very visible but remains unacknowledged. The current paradigm of development, much dependent on the 'Expert' and S&T, erodes this self-sufficiency and puts People and their futures very much in the hands of few. This can be seen quite starkly in reconstruction.

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[1] Source: The UNDP/DMT Response to the Gujarat Earthquake: Some of its Good Practices

3. Approaches in Reconstruction

There are several approaches to reconstruction[2] which have been tried out by the government and civil society organisations at different points of times in different combinations. They can be broadly categorized as under:

Cash Approach: Unconditional financial assistance is given without technical support. In this approach, the affected families are given a pre-determined amount as assistance. The decisions of how and what to use the money given is left entirely to the affected family. In this approach, the family can use the money for reviving their livelihood, for reconstruction/ repair of their homes, or even migrating to another place.

Owner driven reconstruction (ODR): In an ODR approach, the affected people are given a combination of cash, materials and technical assistance to repair or rebuild their houses. The people then take up the construction themselves or may hire a contractor/ labourers to execute the job.

ODR is now considered the most empowering and dignified approach for households, as the term "owner" in ODR refers as much to the ownership of the building process as to the ownership of the house. The key difference between this approach and other approaches is that contractors and paid laborers are accountable to the homeowner rather than to an external agency and hence the control of the process and the execution is entirely in the hands of the homeowners.

Community-Driven Reconstruction: Financial and/or material assistance is channeled through community organizations that are actively involved in decision making and in managing reconstruction. CDR entails varying degrees of organized community involvement in the project cycle, generally complemented by the assistance of an agency. The degree of control over reconstruction by the community in CDR projects varies between agencies and from project to project. The agency may take the lead, suggesting housing designs, technologies, and/or materials and delivering construction inputs and training. The agency may also employ skilled and unskilled laborers from the community or facilitate the formation of construction committees. At the other extreme, the community may manage most of the reconstruction process and receive only the support of facilitators ("collective ODR").

Agency-driven reconstruction in situ: In this approach, a governmental or nongovernmental agency hires one or more contractors (either from the community itself or from outside) to design and build the houses. Design, materials, and expertise are likely to be imported from outside the community. The community may or may not be consulted on certain aspects of the project, such as house designs. House owners may be asked to take over some building tasks, such as curing concrete. Whereas house owners may also hire contractors within the framework of ODR, the principal contractor is accountable to the agency and may be contracted through formal tendering procedures.

Because the reconstruction takes place on the owners' own land, it gives the homeowner some degree of control over quality, and sometimes the opportunity to participate in specific tasks. During construction, owners may be able to make suggestions to or modify the design. This approach eliminates the hurdle of land acquisition and generally allows the household to know where its house will be located. However, if housing designs are standardized or different from

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[2] Handbook for Reconstructing after Natural Disasters; *www.housingreconstruction.org*

local designs, it may be difficult to fit the houses into pre-disaster settlement layouts or to modify them later.

Agency-Driven Reconstruction in Relocated Site: In this approach a governmental or nongovernmental agency contracts the construction of houses on a new site, generally with little or no involvement by the community or homeowners. The community, government or agency supporting the reconstruction may purchase the land for the new settlement. Upon completion, the houses may be allotted through a lottery or using criteria defined by the community or the agency, or both.

This approach can lead to the construction of costly, inappropriate housing of poor quality and settlement arrangements that do not meet the socio-cultural and livelihood requirements of the people, causing severe economic consequences and low occupancy rates. The argument that this approach results in higher construction quality is rarely valid, because of poor supervision or the lack of qualified contractors. Moreover, finding an appropriate site can be a major challenge; failing to do so is, in fact, one of the principal reasons for dissatisfaction with this approach.

Comparison of Reconstruction Approaches

Reconstruction approaches can be compared according to the degree of household control, the form of assistance, the role of the actors and where the reconstruction takes place. The factors can be combined in many ways. The following table compares the five approaches discussed in this chapter.

Reconstruction approach	Degree of household control	Form of assistance		Role of actors			Location	
		Financial	Technical	Community	Agency	Contractor	*In-situ*	**New site**
Cash Approach	Very high	Cash only	None	None	None	Household may hire	Yes	No
Owner-Driven Reconstruction	High	Conditional cash transfer to household	Tech Assistance/ Training of household	None	Project oversight and training	Household may hire	Yes	No
Community-Driven Reconstruction	Medium to high	Transfer to household or community	Tech Assistance/ Training of community and household	Project organization and oversight	Project oversight and training	Community may hire	Yes	No
Agency-Driven Reconstruction *in-Situ*	Low to medium	Funds handled by agency	Limited or none	Limited	Management of project	Agency hires	Yes	No
Agency-Driven Reconstruction in Relocated Site	Low	Funds handled by agency	Limited or none	Limited	Management of project	Agency hires	No	Yes

4. Overview of three disasters: The Context

Three major disasters that have occurred in the last decade and have caused massive destruction to life and property are the Gujarat Earthquake, the Tamil Nadu Tsunami and the Bihar floods. Reconstruction in each of these disasters has been distinctly different with varied impacts on people and environment. And in each of these, the relationship between the 'citizen' or even the 'client' and the 'expert' is brought sharply to the fore; the resulting responses of the local communities as well as the civil society organisations support and articulate the propositions of this case study.

The Gujarat earthquake: was large scale and caused massive destruction. Earthquakes recur infrequently. The reconstruction was a progressive owner driven approach, with choice of building materials and technology firmly in people's hands. This kind of progressive policy initiatives legitimized traditional and alternative practices and created spaces for people's knowledge system to be expressed.

The Tamil Nadu tsunami: fairly large scale destruction and highly infrequent occurrence. The Government responded with total control over reconstruction process with little or no choice or control in people's hands. This approach delegitimized and rejected traditional practices of the people.

The Bihar Kosi floods: large scale massive destruction, recurring annually. Traditional practices are largely prevalent with bamboo and mud as materials used extensively in rural home construction. The government has pushed for a standardized, 'pucca', concrete houses; and has also been steeped in conflicts with the Central Government over funds; delayed reconstruction response has resulted in people going ahead with their own reconstruction.

The Gujarat Earthquake

Gujarat suffered from an earthquake measuring 6.9 on the Richter Scale on January 26, 2001. Over 20,000 people died and about 167,000 people were injured. Nearly one million people were rendered homeless. Over 3,48,000 homes were completely destroyed and 8,44,000 partially damaged (ADRC 2001). The Government of Gujarat (GoG) set up the Gujarat State Disaster Management Authority (GSDMA) that would implement the reconstruction and rehabilitation, with support from various other agencies in the quake-hit area (ADRC 2001). The rehabilitation/ reconstruction effort was the biggest-ever housing program undertaken in the entire world in terms of numbers and geographic area. As part of the reconstruction, 24 villages were fully relocated and 37 were partially relocated.

> **Comment:** What is the full reference for this ADRC, 2001??

A systematic public consultation carried out by the NGO network Abhiyan in 480 villages revealed that over 90 percent of the Gujarati villagers refused the idea of relocation. For some time the State Government insisted on its approach but when it became clear that relocation was not only opposed by professionals, civil society organizations and the concerned villagers but also unacceptable to the World Bank, it finally abandoned its relocation plans. The Government of Gujarat thus adopted an "owner-driven" reconstruction approach. The approach consisted in offering financial and technical assistance to all those who preferred to undertake reconstruction on their own and did not want relocation and full scale 'adoption' by an external agency. Given

> **Comment:** What Abhiyan was this??

the option, 87% of the people opted for financial compensation and to reconstruct their houses on their own[3].

The different approaches and options given to the people created options to be completely independent and build for themselves, or could engage with an organization which would help and facilitate the building process by providing expertise and guidance, or alternatively they could hand-over the building process completely to someone else – either an NGO or even a contractor. **People made different choices and there were different impacts and satisfaction levels.**

The Tsunami in Tamil Nadu

In December 2004, India experienced the devastating effects of a tsunami, caused by a series of earthquakes in the Bay of Bengal. The earthquakes set off giant tsunami tidal waves of 3-10 meters in height, which hit the southern and eastern coastal areas of India affecting around 2,260 km of the coastal area besides the Andaman & Nicobar Islands.

The government of Tamil Nadu, with assistance from the World Bank, the Asian Development Bank (ADB) and the UN Development Programme (UNDP), developed a comprehensive Emergency Tsunami Reconstruction Project (ETRP). Under the ETRP, the government planned to provide assistance to repair, rebuild or construct 140,000 damaged houses in Tamil Nadu and Pondicherry. NGOs, voluntary organisations and public and private sector enterprises were invited to 'adopt' villages for reconstruction.

The government announced its reconstruction policy in January 2005; housing reconstruction was to be either supported through financial assistance from the government or to be ensured through public-private partnership, i.e. through the support of civil society organisations. Once the government realized that there were sufficient non-governmental agencies and funds to ensure housing reconstruction it withdrew from its offer of financial assistance and handed over the reconstruction task to NGOs.

Tamil Nadu's initial rehabilitation policy entailed permanent relocation of affected communities whereby the government would provide land for housing sites and common infrastructure. This led to immediate tensions on the ground and to stiff public resistance. Fierce opposition and the difficulty of finding land for relocation led the government to modify its rehabilitation policy through a new government order. The new reconstruction policy retained the essence of the previous housing policy in terms of public-private partnership but modified the relocation issue, which remained mandatory only for people residing within 200 m of the high tide line and optional for those between 200 m and 500 m. Those beyond 500 m would be entitled to housing assistance *in situ*.

The government's post-tsunami response was a very centralized response, where the decision-making, implementation, monitoring and evaluation were managed almost entirely by the government through its bureaucracy with active support from the civil society organizations (CSOs).

The reconstruction was predominantly a contractor-driven approach and community participation typically remained at a minimum. This was determined by the inherent nature of government's concept of partnership, which viewed civil society organizations as little more than contractors. Monetary capacity, rather than experience in post-disaster capacity or contextual knowledge

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[3] From Gujarat to Tamil Nadu: Owner-driven vs. contractor-driven housing reconstruction in India; Jennifer Duyne Barenstein

became the only apparent criterion to assess the competence of an external organisation in getting involved in reconstruction[4].

Bihar Kosi Floods

The 2008 Bihar flood, which is one of the worst and disastrous floods in the history of the Indian state of Bihar, occurred due to a breach in the Kosi embankment near Indo-Nepal border (at a place called Kusaha in Nepal) on August 18, 2008. The river changed its course and inundated areas which hadn't experienced floods in many decades now. The flood affected over 2.3 million people in the northern part of Bihar. The flood submerged most of the Kosi alluvial plain area, which is very fertile and has dense agrarian population. The total population of 33,45,545 living in 993 villages of 412 panchayats of 5 districts was affected, in which 3,40,742 houses were damaged and 7,12,140 animals were affected.

The reconstruction in the aftermath of Kosi floods ran into a tussle between the State Government and Centre. Bihar's demand for a Rs 14,808.50 crore-special package was ignored by the Centre, which took the view that Rs 1,010 crore given to the state government as aid would take care of the relief and rescue operations as well as the rehabilitation and reconstruction programmes. The State Government has said that it requires Rs 4,500 crores for the construction of approximately three lakh houses alone[5]. Almost one year after the "national calamity", Bihar has ended up getting only Rs 117 crores of additional assistance.

While this tussle has been going on for over a year, the people, fed up and unable to wait, went ahead with their own reconstruction. During our field visit in February 2010, many villagers said that there had been no reconstruction announced or started by the government. Many NGOs had in the meanwhile carried on with providing and constructing temporary, interim shelters.

Kosi Rehabilitation and Reconstruction Policy finally announced the Kosi Rehabilitation and Reconstruction Project whose main purpose is to reconstruct the houses, to provide community facilities, complete restoration of infrastructure and livelihood support. It proposed building, retro fitting, repairing and reconstruction of houses for the people through appropriate technology. The government invited the civil society organisations as well as private sector into a PPP approach. The policy of "build better" with a beneficiary-driven approach was to be adopted.

The Policy clearly announced that all the private and public houses shall be reconstructed on the basis of earthquake-resistant design and from the point of view to fight the floods situation in a better manner, in the future. For this, institutional arrangements will be made for promoting the use of calamity-resistant techniques, like necessary technical training, retrofitting, publicity of new construction techniques and the arrangement of material.

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[4] From Gujarat to Tamil Nadu: Owner-driven vs. contractor-driven housing reconstruction in India; Jennifer Duyne Barenstein

[5] FM forgets Kosi victims, funds Lankan Tamils; Giridhar Jha; India Today July 8, 2009

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5. Policy environment & Regulatory mechanisms:

Systems that determine reconstruction approaches

In the last decade, after the wake of the Latur earthquake and the Orissa super-cyclone, and several other disasters, the government and bureaucracy have woken up to the needs of a regulated and systematic reconstruction response. There has been a paradigmatic shift in India's approach to disaster management. The new approach, multi-sectoral, multi-disciplinary, proposing to be holistic and proactive, is now being sought to be built into the development planning process itself[6].

Until recently disaster response was a knee-jerk response. There were no specific legislatory mechanisms at the Central level that provided a legal framework for disaster response. There have tremendous moves to systematize disaster response and recovery by the government. All that the government has done and proposes to do in future seems to be impressive on the face of it. However, one is tempted to ask this question: How far has the State been successful in performing the critical function of disaster management, recovery and reconstruction?

The policy decisions of the Government, after all, regulate the kind of reconstruction approach that will be taken, which largely determines the impact of reconstruction on the plurality and sustainability of techniques, materials and design, as well as the satisfaction levels of the affected people.

The Gujarat earthquake reconstruction was tremendously supported by the progressive and people-friendly Owner Driven Reconstruction (ODR) approach and supportive policies and regulatory mechanisms. It saw a variety of approaches in reconstruction methodology that combined people, policy, funding and implementation in different ways to suit the specific context.

In the ODR approach the overall satisfaction with the quality of housing was 93.3%, while in the Community driven / participatory approach the satisfaction was 90.8%. In the in-situ approach satisfaction was 71.6% whereas in the contractor driven relocation approach satisfaction levels were as low as 22.8%.

Comment: WHERE ARE WE CITING THESE FIGURES FROM? IS THIS PRIMARY DATA FROM OUR SURVEY? MENTION THE SOURCE CLEARLY, SEEMS TO BE IMPORTANT IN TERMS OF OUR HYPOTHESIS OR PROPOSITION

The majority of the people who reconstructed their house under the ODR approach employed construction materials with which they were already familiar, such as bricks, stones and wood. Many people succeeded in rescuing some material from their old houses. Most houses were reconstructed *in situ* following vernacular designs and spatial arrangements, so that the villages reconstructed with Government financial assistance maintained their traditional character. Some people however also introduced innovations, such as flat roofs reflecting the changing tastes and preferences and a selective adoption of new designs, building technologies and construction materials. **Such diversity did not only reflect variations in local values and aesthetics, but also variations in housing requirements**[7].

Comment: INCOMPLETE REFERENCE

The post-tsunami response was, on the other hand, a very centralized response, where the decision-making, implementation, monitoring, and evaluation were managed almost entirely by

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[6] Management Of Disasters And Crisis Situations In India With Focus On The Poor; Katar Singh and Vishwa Ballabh; http://www.adb.org/Documents/Reports/Consultant/TAR-IND-4066/Agriculture/singh-ballabh.pdf

[7] A Comparative Analysis of Six Housing Reconstruction Approaches in Post-Earthquake Gujarat; Jennifer Duyne Barenstein in collaboration with Vijay Joshi, Swati Shriniwas Shinde, Shailesh Vyas, Yogesh Jadeja

the government through its bureaucracy with active support from the civil society organizations (CSOs). These organizations played a role of being negotiators and interface between the people and the policy makers and also eventually became the contractors and implementers euphemistically called 'partners' of the state governments.

As opposed to Gujarat where shelter reconstruction involved agencies with different reconstruction approaches, in Tamil Nadu, the contractor-driven approach was the dominant paradigm and participation of affected people typically remained at a minimum. This was determined by the inherent nature of government's concept of partnership, which viewed civil society organizations as little more than contractors. The reconstruction in Tamil Nadu was mostly unsatisfactory to the people, with the houses being socio-culturally inadequate, of poor quality construction, and the relocation and fragmentation of communitites generating severe social conflicts, etc.

Guidelines, Building Codes and Norms

Construction and reconstruction involves not only engineering aspects but also a number of planning and architectural aspects, especially with the kind of structures and regional development that are becoming mainstream. Building codes and bye-laws have been a natural evolution as construction practices have grown and evolved over time. The emphasis on rapid industrialisation catalysed the need for standardisation and regulatory mechanisms to assist in the systematic growth of the industry and also to deal with the emerging concerns for environmental protection and energy conservation.

India, apparently, has rigorous building codes. These codes have been incorporated into the by-laws adopted by the municipal corporations. These by-laws require mandatory compliance with the building codes. However, in rural areas, since most of houses are non-engineered, and though there are standards for non-engineered houses, these are not enforced and there is no regulatory authority that does this.

After the Gujarat earthquake, the Ahmedabad Municipal Corporation (AMC) deployed several teams of structural engineers, architects and senior civil engineers for a technical survey of all the damaged buildings. Each team came up with at least four to five buildings on an average, which would have to undergo major repairs before the occupants could move back in. These teams found many violations of the Indian Standard Code and the violations were most prevalent in low-rise structures. The quality of concrete used in columns and building frames deviated from norms stipulated in the building codes. At Bhuj, all of more than 100 multi-storey buildings that were built over the last five years either collapsed, or have been certified as unsafe for habitation. The builders cut cost, used more concrete and less steel. Staircases were not integrated into buildings, etc. which caused their collapse. Although the AMC appointed the Centre for Environmental Planning and Technology (CEPT) as a nodal agency for providing technical services, it was unable to find enough structural engineers. A great number of structural engineers were required to deal with the reconstruction and retrofitting all over the state.


Figure 1: A leaning building. Recipe for disaster.

This situation brought one fact to the fore. RCC structures are most mooted for their 'safety' and durability. If, however, technical requirements are not strictly followed, these aspects of the RCC structure becomes meaningless and they only end up becoming a hazard – which instead of just injuring can very well become the reason for loss of lives. Since RCC is not traditional material, people are not familiar with its nature and its requirements and often fall short in their ability to maintain and repair these structures. These then degrade or collapse within a few years, defeating the very purpose for which they were built i.e. to provide a 'pucca' and a 'safe' house.

A degraded RCC ceiling. People neither have the money nor the skill and knowledge to maintain and repair these kind of structures.Chatar Ghat, Khagaria District, Biha.r
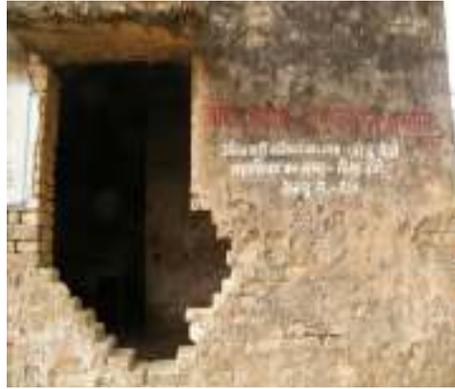
An Indira Awas Yojana structure which is degraded and dangerously falling apart being used as an Anganwadi. People are not able to maintain it, but continue using this structure. Ilmas Village, Samasthipur District, Bihar

Reinforced cement concrete (RCC) structures need a lot of care in construction and maintenance especially in a highly corrosive coastal environment. If the quality of construction cannot be ensured, over a period of time, it can jeopardize safety as well as tremendously escalate maintenance costs.

Poor quality of construction is not due to the fault of building materials, but the way in which they are used. The quality of construction and the attention to detail assume great importance in India, where standards and specifications are not strictly followed in the residential building construction scene. It is therefore essential to understand some fundamental issues with regard to various aspects of construction.

- Benny Kuriakose, Architect

Contradictions in guidelines and building norms and practices

In normal times, more than 70% of the people build their own homes - all different, using a variety of locally available materials, completely custom-built and contextualized, energy efficient and user-friendly. The government, the private sector and any other actor builds either the remaining 30% and is of course involved in regional infrastructure development.

Hence, People's Architecture is a dominant feature in the country and traditional, people's methods and techniques would and should be the dominant mainstream technique. And being

the dominant mainstream method should be influencing the kind of research that takes place or the kind of policies that get constructed. However, this is not the case. Neither the government's policies nor the R&D laboratories of any institution "recognize" these dominant methods, dismissing them as frail, temporary and unsafe structures. They reject the dominant, natural materials being used: mud, stone, grass, bamboo, wood and a host of other local materials, in favour of the modern and new materials of concrete and steel.

These two strong forces – the government and the expert – are much involved in creating and promoting "new" materials and technologies that are expensive, not easily or locally available, difficult to create or maintain by ordinary people in their day to day lives and above all, are destructive to the natural environment. The policies and regulations support these new materials and technologies and the market is driven by them and which in turn drives the R&D further in the same direction. Slowly, over the decades, these non-dominant materials, techniques and technologies have become "mainstream", in the process sidelining and eliminating the local and traditional materials.

In sharp contrast to usual construction by people, in reconstruction, more than 80-85% of the homes get routinely constructed by the civil society organizations, contractors and the government, for the people. Almost all of them are built with the "new" technologies, with some of the alternatives also occasionally coming into use. The traditional, local materials almost always do not get used. Uniformity is maintained with the design, material and technology almost always "decided" by the dominant forces of government and scientist.

Yet, in contrast to this all-prevalent 'practice', all the reconstruction guidelines advocate involving people in the decision making **-** in design, in monitoring, and in execution. The guidelines refer to "sustainable" and "safe" approaches, advise use of local materials and local skills that will help the livelihood regeneration in the region.

These kinds of contradictions between mainstream practice and trends and codes and guidelines are difficult to understand and analyse.

Where 'guidelines' fail and/or are inadequate

Guidelines in times of reconstruction become particularly important, for they are instrumental in determining what ultimately becomes a norm at that particular time and that sets examples of what 'development' is about in further times to come. Hence, it becomes important to ensure that these guidelines are inclusive of traditional practices and promote plurality and sustainability. This would not only enable people to retain their self-sufficiency and self-reliance but also will not distort the understanding of 'development'.

Even if the initial policies of the government do not include some of the more progressive aspects, it has to remain open to critique and be flexible enough to incorporate observations and recommendations of the Citizens. If it does not do so, assessments and evaluation by the Citizens become mere lip-service and eventually erode any trust that can be built between the Citizen and the Expert/Establishment.

We clearly see instances of failures in Tamil Nadu. The first socio-technical assessment of post tsunami reconstruction[8] in Tamilnadu, conducted by the UNTRS pointed out that there were many constraints in reconstruction due to use of concrete based technologies involving high professional skills instead of artisanal knowledge, extremely high costs and relocation of

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[8] www.un.org.in/untrs/reports

settlements. High demand levels had put pressure on extraction of materials and often led to scarcity of good quality materials and skills. The assessment reports particularly recommended inclusion of more materials and technologies that were in use in the region traditionally so that people have wider options to build safer habitats with their own resources and skills. However, these recommendations of the assessments were not incorporated and the reconstruction continued along earlier lines. In the final assessment, the evaluators pointed out these lapses of the government to incorporate the observations and recommendations of the evaluation teams.

This was not the case only in the construction of permanent shelters, but also in putting up of temporary and interim shelters. The civil society organisations with help of many technically qualified experts had presented to the government recommendations for guidelines on temporary and permanent shelters along with the processes that are best put in place. Initially, these recommendations were well taken; however, at the implementation stage, suddenly all these recommendations were put aside and temporary shelters were built using materials that had to be largely brought from outside. These were made out of bitumen sheets, which were supposed to be fire-resistant, in favour of the local coconut-leaves thatch and mats (which was also expected to become a livelihood generation option for the people) which had been recommended by the CSOs.

The mid-term assessment of Shelter Reconstruction by UNDP, Hunnarshala and NCRC clearly indicated that though lay out plans for each site had been prepared and formal approval procedure followed, planning norms about open spaces, community infrastructure, land use, etc. were not incorporated except in few instances. It recommended that layout planning norms must be provided as guidelines and implemented; further, it recommended that site analysis and planning guidelines should also be brought out so that the same can be followed.

One sees a similar drive in Bihar Kosi floods reconstruction, with recommendations pushing for a RCC-column-beam structure in the name of "safety" without adequate measures to ensure that the required building codes and standards are met. The issues of safety and durability become meaningless in face of corruption and non-compliance of requirements, while only going to eliminate plurality, people's systems and sustainable approaches. The analysis produced below, by one of most respected advisors to the government, is an example of such a solution being posited for Bihar in particular and for India in general:

Mud and Unburnt Brick walls when inundated under water become soft losing their dry strength by even as much as 85% of the dry value and therefore, start collapsing when inundated for longer duration of time.

Burnt Brick and Stone houses are usually constructed using mud mortar in the rural areas. The mud mortar also becomes soft under continuous wetting under water by which the walls lose their bearing strength and tend to collapse under their own weight or the weight of the roof. Also, if the water is flowing, they collapse more easily under the dynamic pressure of water. The houses made from light weight materials like GI or other Metal sheets or Grass, Leaves, Reeds, Bamboo etc. easily float away as soon as their holding down ports are uprooted by the flowing water.

One has to choose from such materials and technology options which will save the house from all types of natural hazards, for example one can use deep piles for the foundations with an appropriate plinth beam above the high flood level, use reinforced concrete or reinforced brickwork super-structure with flat RCC slab-beam roof approachable by an appropriate staircase. This will result into a very safe house.

Considering the multi-hazard situation in the districts in North Bihar, it is strongly recommended that all houses under the proposed scheme of the Bihar Govt. should not only be of permanent nature capable of resisting the flood hazard but also should be made safe, in the first instance, against the earthquake hazard postulated in the seismic zoning map, of India. The houses should have a flat roof as recommended by NDMA, Flood Safety Guidelines, which could be used by the residents as temporary shelters. The designs proposed here satisfy all the safety requirements and have been so planned that it is feasible to construct such houses at very economical costs.

Professor Anand S. Arya And Ankush Agarwal
Under The GoI-UNDP Disaster Risk Management Programme

6. "Whose space is it anyway?"

The 'Client' and the Commission

The *Client* has a huge impact on *what* finally gets built, *when* it gets built and *how* it gets built. Who builds becomes the next important factor. A combination of people-as-client and people-as-builders has completely different results from people-as-client and contractors-as-builders or people-as-client and NGOs-as-builders or government-as-client and NGOs-as-builders or government-as-client and contractors-as-builders. Who decides what gets built and who executes the decision impacts the conditions and constraints of reconstruction.

In Gujarat the different approaches and options given to the people created options to be completely independent and build for themselves, or could engage with an organization who would help and facilitate the building process by providing expertise and guidance, or alternatively they could hand-over the building process completely to someone else – either an NGO or even a contractor. People made different choices and there were different impacts and satisfaction levels.

The majority of the people who reconstructed their house under the ODR approach employed construction materials with which they were already familiar, such as bricks, stones and wood. Many people succeeded in rescuing some material from their old houses. Most houses were reconstructed *in situ* following vernacular designs and spatial arrangements, so that the villages reconstructed with Government financial assistance maintained their traditional character. Some people however also introduced innovations, such as flat roofs reflecting the changing tastes and preferences and a selective adoption of new designs, building technologies and construction materials. Such diversity did not only reflect variations in local values and aesthetics, but also variations in housing requirements[9].

The entire resettlement and reconstruction process was controlled by the Tamil Nadu government in a way that rendered NGOs into mere contractors and the community into 'beneficiaries'. The contract was between the government and the NGO and the construction process was monitored by the local bureaucracy. The designs had to be submitted to the local technical bureaucrats for approval before construction itself and could not be changed or modified thereafter.

The government, thus, became the 'super client' with all interventions responding to the priorities expressed by this entity. Added to this was the fact that in most cases, the beneficiaries did not know which house was theirs, so even if so desired by an implementing NGO, the design could not respond or be adapted to the lifestyle, occupational needs, community relationships, size of family, special needs etc. of the beneficiary. The architect/ designer/ planner too, helpless in the face of a political and bureaucratic 'whip', was forced to adhere to prescribed building codes, to RCC-column-beam-structures and had very little scope to negotiate a better design response.

The uniformity, while trying to eliminate inequity, also eliminated creativity and sensitivity. Many organizations brought in whole execution teams from outside and went about reconstruction entirely on their own with little interaction with the communities. Some of them achieved great speed and efficiency and 'completed' their 'jobs' in the stipulated time. However the 'lack of ownership' felt by the community was evident, as in many instances these houses were left unoccupied due to a variety of reasons. During our visit to some of the villages in Villupuram District in 2006, we observed that the houses in Mudaliyarkuppam, Villupuram District, were

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[9] A Comparative Analysis of Six Housing Reconstruction Approaches in Post-Earthquake Gujarat; Jennifer Duyne Barenstein in collaboration with Vijay Joshi, Swati Shriniwas Shinde, Shailesh Vyas, Yogesh Jadeja

unoccupied. 99 houses had been built by an organisation. However the community continued to live close-by in their hutments as their contention was that there were around 120 households in the village and they needed those many houses. Otherwise this would divide the village. One of the community persons said, "How can we live in big houses, when some of our own family members are living next to us in huts? Will it not create problems between us?". Justice and equity become one of the major issues in such instances.

Many NGOs did their best to get the community to participate – they held consultations with the community, tried to understand the community's needs and requirements and tried to inform the community of the choices available under these circumstances. However, in many cases it was a rocky path as the community people did not know which were their houses or even relocation sites and could not identify with the process. Over a period of time, they became blasé and tired, and participation often became more a consensus building process.

In some cases, NGOs went "outside" the process and worked directly with the communities and they became the clients. The land was bought either by the community or purchased by the donor/NGO on their behalf and the villages were resettled on them. The reconstruction process here was entirely different as the designs, processes and priorities were entirely set by the communities. They also directly engaged in the construction, monitored the construction process and negotiated for any changes.

Veerapakupathy – when people decide

Rajakamangalamthurai – within the CRZ (Coastal Regulation Zone)

Architecture & Development's intervention in Rajakamangalamthurai, Kanyakumari District, was a case where the NGO decided to go out of the government's process and work directly with the people. A&D was much against the "200 metres away from the sea" requirement. They and the people believed that the people should stay where they always have and where they wanted, in a way that did not hinder their livelihood. As part of this project, the donor agreed to support the purchase of land for the people. 2 acres was purchased in the village, and homes were built for the beneficiaries. Because the project was "outside" the government's process, no help could be garnered from the government. Water, electricity, sewage and services – in fact all the parts which the local panchayat would pay for had to be paid for by the project. Special permissions had to be taken for bringing in the basic services to the project.

After the tsunami destroyed the lives and assets of the people of Veerapakupathy, Kanyakumari, they decided to relocate the village farther away from the sea. They bought some land close to the old village but 500 meters from the sea in February 2005. They chose not to be part of the Government's reconstruction process. They looked for their own funding and own implementers.

The land was initially divided into seven different plots, owned by different owners. The community managed to assemble it as one allotment. They bought the land at the price of 4,000, 5,000, 5,500, and 7,000 INR per cent. In total they acquired 327.5 cents of land, or 142,645 square feet.

The community organized itself so that the people, most affected by the tsunami and with the lowest income would have to pay less for the same space than a less affected person. The families that had lost their house completely paid 18,000 INR for their plots, the families which had their houses only partly damaged paid 20,000 INR, and the ones which had not suffered any damage to their house paid 25,000 INR.

The land was then divided into 82 plots and to avoid any mis-understandings, these plots were allotted through lottery. In total, 82 families bought 3 cents of land each and participated in the acquisition of 51 cents of communal roads and 31 cents of community land. 76 families came from Veerapakupathy and 6 other families came from neighboring communities or with family ties with people in Veerapakupathy. The power of attorney was given to Ezhaya Perumal, a senior village member who kept the community land in his name until it was possible to hand it over to the local administration. The new village came be known officially as Veerapakupathy Nagar Therivilai.

One of the key elements of this village has been the community's involvement in all aspects. In fact, almost all decisions were taken entirely by the community – purchase and allocation of land, village layout, design of the houses, choice of organization they wanted to work with, facilities required within the village, etc.

What was very clear in this particular instance was when people decide, the questions of equitable distribution are taken care of, especially in a cohesive community. The community ensures that the least able gets adequately compensated while the most able supports the process.

There were many examples that came up during field visits that illustrate that community decisions could be inclusive and just. The fishing community in Tamil Nadu proved this time and again, right from the relief processes to the reconstruction process. The community decisions were taken by the 'community elders'. The decision making systems are complex among the fishing community. Each village has its own group of 'elders' and each cluster of villages then has an 'elders' group'. Hence decision making among the fishing community gets decided by the groups of elders and is very strictly adhered to by the rest of the community.

During the relief distribution process, in many instances, the community refused to accept the provisions and materials, if it was not distributed to the whole village. The decision extended to reconstruction too. In many reconstructed villages, people did not occupy houses because the all the families in the village did not get houses. The decisions to provide housing to only the 'affected' families had created divisions among the community – between the affected populations and the rest of the village. Veerapakupathy too had similar problems. Only 18 families were technically 'affected' and were expected to get compensation and 'new' houses. However, the whole village decided that it was not possible to discriminate in such a way. Thus, they decided to use the money received in compensation and buy their own land and build for themselves.

Site allocation: Relocation Vs. In-situ Reconstruction

Relocation versus In-situ Reconstruction has always been a contentious issue, which makes it difficult to build a consensus within the community and create harmonious negotiations between various stakeholders. The decision is a difficult one and is best arrived at in full participation with the community at local and even regional levels. Decision on in-situ reconstruction or relocation also goes a long way in determining what kind of structures will get built. A relocation approach pre-supposes a standardized reconstruction of large-scale houses on given sites in a short period, almost always ending in iron-grid layouts and concrete box houses. In-situ reconstruction, however, due to a variety of site sizes and types, forces non-uniform, non-standardized response.

The reconstruction of Bhuj in Gujarat is one of the best examples of how relocation could be handled in an inclusive manner. With the entire city destroyed and under rubble, relocation seemed inevitable. There were many issues in relocation as well as in in-situ reconstruction. These were however most creatively solved, with the strongest involvement and decision-making

by the community**.** It stands as one of finest examples that show that when the community is directly involved, the best choices and decisions are made.

> Small towns in India have very narrow lanes. They have the cul-de-sac systems. The Environment Planning Collaborative (Ahmedabad) worked in Bhuj after the earthquake. It was impossible to get into the city. The inner city was completely destroyed and because of the narrowness of lanes it was difficult to have rescue systems in place. There were about 588 plots needed whereas there was place only for 390 plots. So if a well laid out inner town was to be developed again, 30% people would have to move out.
>
> We held several public meetings and put the problem before the people. They themselves made a decision. Based on this, everybody was asked to apply stating clearly whether they wanted to move out to a new laid out larger plot or continue staying within the old city with deduction on their original plot size. About 38% opted to move out. The people who had commercial interests within the city, they did not mind having some deductions. So the entire inner city was actually taken away from the owners for a period of three months and re-planning was done. There were a lot of problems at the individual level, which the various committees set-up had to solve on one on one basis.
>
> - Sandeep Virmani, Architect, Hunnarshala, talk on Disaster Rehabilitation,

In Tamil Nadu, the government unilaterally decided that the communities had to be relocated 500 metres away from their shore-side villages as a "safety" norm. The 'resettlement' was riddled with conflict, negotiations and confusion. The conflict has been between the people and the government. Seemingly for the 'good' of the people and their safety, the relocation raised many questions. Why relocate a community that is dependent on the visibility of the sea so far? What happens to the 'remaining' families? Will the communities and some families be torn apart just to fulfill the safety perception of the government? Is there a more nefarious political agenda behind this move? Is the government planning to sell off the coastline to developers? Many such questions were bandied. NGOs, local communities and the government went through a long process of negotiations, which delayed the reconstruction process by almost 6-8 months.

The community managed to negotiate with the government and brought down the minimum distance from the sea to 200 meters instead of 500 meters. They also negotiated such that they could keep control over their old space while relocating to a new site.

The decision to relocate was a bad one for the government in the long-term. Land prices shot up and the government had to pay 3-5 times the price during normal times. In many places like in Kanyakumari, where the density of population is very high and the coastal bands narrow, land was not available at all. Land acquisition became a long process and reconstruction was further delayed and people waited in temporary shelters, and the NGOs and donors waited with funding and implementation teams.

In many cases the lands acquired were very inappropriate to build on – low lying, prone to water-logging areas, areas where the salt water ingress is high, lands on edges of salt-pans, soil too soft to build on, sites too small to accommodate the expected population, lands too far-off from the old community and so on… the list is endless. The sites acquired were so bad in several instances that some of the organizations decided to 'opt out' – they refused to be part of reconstruction on bad sites. Auroville was one such organization and chose not to build at all and played a technical-support role to the implementers. Architecture & Development, on the other hand, in partnership with donors and people acquired land on their own or built in-situ. In another case, the organization built a village where the land was bought by the people themselves and played the role of 'technical consultant' to the community.

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Habitat Planning / Settlement Design

Habitats do not happen. Habitats develop - over time, over years, over decades. They are developed by the people who inhabit these habitats – they add, modify, take away, build, renovate, restore as per the needs that are felt in a given context, in a given time, much related with the geographical conditions and context. It is hence not necessary that a response that was appropriate in a given time, in a given context, with a given community will be appropriate in another time and another context, with another community.

Hence, one can only take a habitat development *approach. which* would mean that the response is appropriate in the given time and in the given context with an eye for future expansions and modifications - a response that comes about when there is a deeper, greater understanding of the environs of the habitation – the land, its undulation, the water resources, the vegetation, the peoples, the lifestyles and patterns, the relationships between humans and humans, between humans and the environment, between humans and animals.

As Rohit Jigyasu articulates, "from histories of ancient cities, towns etc, it is obvious that it was not a matter of mere coincidence that populations, families, groups and communities were physically located in certain neighborhoods and places. Such physical placements were the result of very complex and historically rooted natural and social forces. Traditional settlements are characterized 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 characterized by traditional occupation pattern etc"[10].

Habitat planning, settlement design and site sensitivity often get sidelined in reconstruction. Water channels are blocked, water bodies are filled, trees are felled and undulating land is leveled. This happens in normal times too, but is more clearly visible in reconstruction.

The Gujarat and Tamil Nadu experiences were diametrically opposite. The one in Gujarat was evolved through a discussion with people, while the other was imposed by an external decision. Almost all the settlement designs were made by 'experts' in the field in Tamil Nadu, most often driven by the criteria of efficiency – defined by speed and time. The reconstruction design response here very visibly came from an urban and a 'western', mind, which perceived a compartmentalized lifestyle to be an ideal. Where rural, communal interactions happened seamlessly in a variety of ways – at the well, at the borewell, under the tree, at the tea centre, at the bus stop, at the market, these were now expected to happen in specified, marked-out areas – parks, 'open spaces', community centres, and sometimes nowhere. Where the rural home flowed into the street in a single fabric of private and public life, they were now on demarcated 'plots', that encourage territorial fencing, insulating the family in a way which is new to the community.

Except for a few exceptions, the site planning response has been a disaster in itself. Where earlier the acquired sites were undulating, covered by shrubs and trees and dotted with small water bodies, they now are 'prepared' and 'treated' - cleared, leveled, or filled. The sites lost their character, their ambience and their soul. The environmental costs of such hasty action will be borne by the communities for generations to come. The sites are bare, featureless and the few remaining water bodies only threaten to become potential waste pits. The earlier clustered, meandering layouts of the villages have given way to albeit efficient but unfamiliar and rigid grid formats. Where one fostered interaction and connection, the other has transformed communities to nuclear families.

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[10] Cultural Considerations for Post Disaster Reconstruction; Teddy Boen and Rohit Jigyasu

The post-tsunami reconstruction was completely insensitive to culture and lifestyle as one came upon rows and rows of 'concrete boxes' laid out in army-barracks style grid pattern, with uniform design, uniform materials, uniform colours. It eliminated plurality of design and layout. One is not talking about a few hundred houses here but thousands of houses. It was a disaster in the making.

Layout of an old village. Drawn by the people in a PRA

A grid-iron layout of a newly reconstructed village

The backyards of the new houses

"I think it's a waste of money to level a well moulded site..... If only we didn't level sites, and eliminate trees but instead plan to go around them; then we wouldn't get the long monotonous rows of houses to begin with ...." - Laurie Baker

The old village: all natural contours and features intact

The new reconstructed site

Issues about Habitat Planning, Settlement Design, and regional development, almost always decided by the government with little or no involvement of the people, can best be highlighted by the discussion of the 2 major instances in the tsunami affected Tamil Nadu and in the Kosi floods affected Bihar.

The Sellur fiasco

David Korten brings out the dilemma interestingly, referring to writings when Rem Koolhaas's firm's had initiated work in China. Koolhaas had written: "It seems clear that somehow we should be able, when given the impossibly difficult problem of designing in two weeks a city for three million people, to respond with vigor and skill."

To this, David Korten says: But was it not conceivable that the design for a city for three million should take longer than 2 weeks? That some background research, and at the very least environmental studies would have needed to be done? That some reflection might have been necessary on which populations were to be displaced to accommodate and populate such a city? That perhaps such a commission presented serious ethical issues for the architect and might have called for his or her principled resistance and that *that* was where vigor and skill were called for?

> If you come across a client, I mean one who wants everything that you don't believe in, then you can say that, really, you've come to the wrong person and I don't want to do it.
> - Laurie Baker

These are precisely the dilemmas and questions that confronted the Habitat professionals who were expected to create a "master plan" for Sellur in 2 weeks. Though the planning and design was not for 3 million people, it was still complex, as it involved bringing together different communities, from different villages. It meant uprooting existing community inter-relationships

and planting these into new relationships and the host of socio-cultural-political issues that made felt during such implantations.

Sellur in Tamil Nadu is the rehabilitation site of 53 acres for 1,000 families. The site was allocated to 6 NGOs to build new houses for 'beneficiaries' who were from 5-6 different villages, from different communities and having different occupations. The site was an undulating land, with little water bodies and trees dotting the landscape. There was a main road, the highway that cut across the Site and high tension wires that ran diagonally across the land.

The problem of creating a Layout was complex as it involved a variety of stakeholders from different walks of life. There were the socio-cultural, environmental and political aspects to be addressed. A&D and the ODTF combine were approached for doing a study and layout mapping. It was clear that this would require a lot of time – time to understand the people and communities, their requirements, their inter-relationships. It would require time to organize the layout such that minimum damage is done to the natural features. It would require time to bring

the different NGOs together and arrive at a consensual modality of working. However the combine was given two weeks to complete the plan and to complete a task that would at least take 3 months. It was clear that if one took up the assignment, it would be detrimental to the process of reconstruction and detrimental to the people in the long run. Seeing the impossibility of it, the task had to be reluctantly turned down, even though the challenge was a very interesting one professionally.

The Sellur rehabilitation site is a sight to see now. All trees were cleared. Land was filled and flattened. And a uniform, grid-pattern layout was put in place. People were shifted even before the basic services were put in place. The water bodies became places for defecation and were contaminated. The site was prone to flooding during the monsoon.

What is the responsibility of the government, the professional and the people in such a situation? What kind of violence gets perpetrated, unwittingly perhaps, by unconsidered decisions of 'experts'?

The Kosi Embankments – an elephant in the room

It is impossible to talk about floods in Bihar without talking about the embankments being built around its rivers. The embankments are "an elephant in the room" that everybody knows about, understands and can see, but refuses to acknowledge - either its presence or its impact.

When we went to Bihar, and we talked to people about the August 2008 floods, it became more and more clear that these particular floods which were highlighted so much in the press are the least of their problems. We found out, by talking to the people, that the Kosi has breached its embankments several times, eight times to be exact, earlier, and the people living along this river have repeatedly been subjected to the impacts of river in spate rushing out. It became clear that

life in Bihar could very clearly be demarcated – life before the embankments and life after the embankments.

The rivers in Bihar come rushing down the Himalayas, bringing with them silt laden waters that flood and spread during summer and monsoon. The floods would spread over a large area, leaving behind filled up tanks and ponds, a layer of live-giving silt that rejuvenated the agricultural lands. The people would have to "manage" living during the flood-season which was about 2-3 weeks in a year. The people had learnt to live with the floods, understanding the rhythm of the rivers.

However, during the "modern development" and growth period, the government decided to "fix" this problem by building embankments on both sides of the Kosi, thus forcing her to flow inside it. The solution worked – but only for a little while. Before long, the embankments became one of the biggest problems of the people living along the river. The silt brought down by the river, kept filling up and thus raising the height of river. Today we can see the river flowing 8-10 ft above the normal ground-level – a sure recipe for disaster.

Every engineer, scientist, technologist knows one fact about embankments – that they will breach. It is a given fact, corroborated with experiences from all over the world. The problem then is what happens when the embankments breach? And that has become the problem now. The river's force has

> "Kosi used to come like a cat before, now she comes like a tigress".
> - Aslam Mohammed, Village Raxia, Seetamarhi District, Bihar

become destructive and the floods that come now damage thousands of houses and structures, fill the lands with sand and silt and costs the government and the people millions and millions of rupees. The river beds rises at the rate of a 1-2 feet per year, rendering any embankment useless after 20 years.

> For us, life is uncertain at the best and death and loss of livelihood certain at the worst. For the other many villages along the embankments, people live in constant fear and threat of an embankment breach.
> - People of Raxia, Seetamarhi District, Bihar

The problem does not end there. The embankments have brought with them long-term problems. The whole drainage in the region has been upset and the waters have nowhere to go. This has created a problem of water-logging for millions of hectares of land. People have lost their lands to water-logging. Where earlier these regions were agricultural regions, now they have over the decades become "wetlands" and one observes a change in the whole eco-system. Habitats have changed. **Reconstruction under such circumstances has become a way of life.** And any debate on reconstruction and ethics in Bihar has to consider the elephant in the room.

> Does anyone listen to the dissenting voice or even suggestions 'not favourable' to the establishment even during peace time? Do laymen have to tell the establishment manned by thousands of engineers that it was their job to keep the river in place and the embankments were meant precisely for that purpose?
>
> Dinesh Kumar Mishra; http://www.hardnewsmedia.com/2008/10/2390

What line does a discussion on Ethics in Built Environment and more important on Science & Technology have to take, under such circumstances, where a "technological solution" has created a perpetual disaster for the people – and especially those who are the most vulnerable, poor and the marginalized. This has been a technology solution that has been violent, unjust, unsustainable and that has totally eliminated a peoples' way of life.

All discussions on Disaster Reconstruction, Recovery and Rehabilitation skirt around the issue. The guidelines and the policies do not acknowledge the root cause of an unsolvable problem, but continue to posit further, similar 'technological' solutions. *How does one reconcile the contradiction in the situation where a solution by the government + expert/scientist combine have imposed a perpetual disaster on the people on one hand and on the other, that they now come with 'support' and 'assistance' and talk about people's participation, 'earthquake safety norms', disaster-proofing and sustainability?*

Building: design, materials and technologies

Design

Jordi Sanchez-Cuenca, an architect for Architecture & Development who volunteered during the reconstruction of three villages in Kanyakumari district, articulated the problem of habitat design and its solution thus: *Improving the habitat, means improving the social and physical structures in an intertwined manner*[11]. The only way a good design can happen is when the people living in these conditions who have a problem are at the centre of any intervention. No professional, no expert can ever understand the true nature and cause of the people's problems like the way they do. Hence, good design cannot happen unless it is the people themselves who define them.

The mid-term assessment of the post-tsunami reconstruction conducted by UNDP clearly indicated that the lack of community participation was visible. Almost nobody from the community was involved in decision making and management of construction. The idea of replicating one standard design alone shows that the house doesn't reflect any particular family's functional needs and such customization is not planned or encouraged. Very little labour or employment is being availed by local people. Materials and technology of RCC being used do not have potential for replicability as they are not affordable and require high engineering skill that are not locally available[12].

> From the results of studies on the performance of buildings during past disasters the following recommendations emerge:
> - Certain building types, such as, earthen houses, random rubble masonry as well as brickwork in clay mud/mortar, should be ruled out in severe disaster prone zones, costal zones vulnerable for cyclone and Tsunami.
> - Rich mortars involving cement and lime should be used in fired brick and/or coursed stone masonry.
> - Required steel reinforcement should be introduced in the walls in both directions of the building.
> - Light roofs should be properly anchored.
>
> "Guidelines For Reconstruction Of Houses Affected By Tsunami In Tamilnadu": Revenue Administration, Disaster Management & Mitigation Department, Government of Tamil Nadu

The guidelines in Tamil Nadu determined what materials could be used and what could not be used and **thus eliminated all traditional and local materials** that were the characteristic of the region and brought in the RCC-beam-column structure in a big way.

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[11] Human habitats have 2 components – social structures and physical structures. The social structures are the institutions, organisations and activities that keep the society together and allow for improvements in all aspects of life: Family, enterprises and other forms of livelihood, laws, norms, traditions and habits, Government and NGOs, CBOs, religion, etc. The physical structures are the buildings and infrastructure that accommodate people and their social structures: Houses, community centres, markets, workshops, industrial buildings and machinery, government buildings, etc.; Roads, water pipes, wells, sewage pipes, treatment plants, electricity poles and lines, benches, bins, sheds, etc. Inadequate habitats have always roots in social structures: insufficient income, no access to good education/ health, social discrimination/ marginalisation, powerlessness (no influence in actions/ decisions that affect their habitat) etc.

[12] Mid Term Socio–Technical Assessment of Post Tsunami Reconstruction, Tamilnadu; Commissioned by UNDP, NCRC and conducted by Hunnarshala

Secondly, a project approach that makes Time + Cost + Quality as the only key factors, invariably means an assembly line approach wherein there is no space for articulation and implementation of customized design.

Materials & Methods: traditional/local, alternative, modern

Though there was no policy environment to ensure such an approach, many NGOs used alternative materials and technologies in shelter reconstruction. Organisations like Architecture & Development, Development Alternatives, Centre for Environment Education, Tata Relief Committee, Habitat Technology Group, Auroville, SIFFS etc. used fly-ash bricks and blocks, rat-trap bond walling and filler-slab roofing, etc. and put in place modern technologies like solar energy, desalinisation for water, extensive rain water harvesting, sustainable sanitation & sewage systems etc. Many of these also have been for "demonstration" reaons, hoping for an eventual acceptance of alternative materials and technologies by the government and thus legitimization of these in the mainstream construction, which was hitherto not available.

Filler-slab roof, rat-trap bond walling, permeable roads and drains (water management), 'pucca' brick and tile bhungas, rain-water harvesting, solar street lights.

"Fusion" approaches

Though there are pros and cons that exist of traditional or local building materials, local communities have synthesized a fusion of the modern materials and technologies and traditional practices in such a manner that the benefits of both are retained whilst eliminating the fall-outs in them. Examples of such "fusion" can be seen especially after a reconstruction is over when the 'core-house' then gets extended with traditional materials – either with a thatch roof semi-permanent structure on the roof or the extensions to verandahs and rooms. Similarly the modern kitchens get adapted too. Kitchens are once again brought out, as the local people like and the core-house kitchen gets used as a storage-cum-additional living/ working space.

In other cases where people are left to build themselves, there have been a variety of combination of walling and roofing materials with a standard, modern 'foundation' and beams. People use a variety of grass, bamboo mats, wattle-daub, earth, brick, etc. fillings for walls and thatch roof, tiles, GI-sheets, plastic sheets, etc. for the roof.

A 'fusion' house built by an affected family themselves. Gi-sheet roof, bamboo jaali and bamboo
slats walls, cement 'columns', bamboo pillars, bamboo roof structure
- Mirgunj, Madhepura District, Bihar

A fusion house: tile-roof verandah; GI-sheet roof for main house, mud walls, bamboo roof structure. A lot of the materials are recycled materials retrieved from the old damaged house.

An Indira Awas Yojana house of brick and cement, tile with bamboo roof structure, cement columns and a mud-thatch-bamboo sleeping quarters as an additional room.
- Jorgama, Madhepura District, Bihar

The reasons for this response are varied. It is economic – the amount of money one has goes a long way in deciding what kind of materials one will use. Second determinant is the skill available. Most people from local communities either have a basic knowledge of how to build or the skill is available within the village. The cost of artisanal labour in local systems is much less than, say, a mason's cost. Third is the durability factor. If money and skill are available, the choice of material is based on its longevity and maintenance requirements. Hence often GI sheets are more favoured over a thatch roof. Or brick with mud mortar is preferred over wattle-daub.

7. People's Initiatives: Plurality, Sustainability and Justice

People's initiatives in built environment have been going on for millennia. From the time the first shelter was built by a human being who wanted to protect himself from the vagaries of nature, till today when people all over the world are continuing to build, it is the initiatives from the communities and the common man that has given impetus to progress.

People have always used what is around them to build. They have used the mud, the stone, the grass, the wood and all naturally available materials that could be picked and chosen from around the area where they lived and used these materials to the best of their ability. This continues to happen even today, not only in rural areas, but also in urban slums. In the rural areas, where local natural materials are available, they are used in a variety of ways – mud, thatch, grass, bamboo, wood, etc. get efficiently used in different permutations and combinations to precisely serve the needs of the family and community. In the urban slums, too, locally available materials are used creatively and ingenuously by people – whether plastic sheets, discarded plywood and tin sheets, or even waste from hardboard and cardboards – all these are put together in the best possible manner to create the shelter that people need.

Laurie Baker, known as the "Gandhian Builder", very beautifully brings out the nature and strength of People's Knowledge in construction in his discourse[13]. He says:

> Before we came along with our high technologies and our science, people over thousands of years were doing what we are now pleased to call research and development. Anywhere you go in India, any village, any rural area there is this, `rural' design that is steadily going on, and this research is not something that was thought out suddenly. It was a system of trial and error — an empirical form of development…

> … I suppose it took many years before I really understood and wholeheartedly believed that wherever I went I saw, in the local indigenous style of architecture, the results of thousands of years of research on how to use only immediately-available, local materials to make structurally stable buildings that could cope with the local climatic conditions, with the local geography and topography, with all the hazards of nature (whether mineral, vegetable, insect, bird or animal), with the possible hostility of neighbours, and that could accommodate all the requirements of local religious, social and cultural patterns of living. This was an astounding, wonderful and incredible achievement which no modern, twentieth century architect, or people I know of, has ever made.

> When I made my own little personal discoveries, I realized that I had merely chanced to find an extensive set of building systems which were in no way 'discoveries' to more than five hundred million people!

The nature of People's Knowledge in construction follows the principles of 'do no harm to another' and 'do not harm nature' and thus are just, equitable and sustainable. They are diverse and plural and context specific. They are very much within the reach of people – physically and economically. And above all and most importantly, these systems foster self-sufficiency within the people, putting all decision making in people's hands. This is seen in the materials used, design logic followed and techniques and technologies used.

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[13] www.lauriebaker.net

The materials are environment friendly – they use very little energy to extract or produce, they are available locally hence do not require transportation, most of them are 'renewable', are efficient in the use of resources and are practical in their application.

Figure 2: Bamboo mat and mud

Figure 3: Bamboo slats

Figure 3: Woven coconut leaves

Figure 4: River bed reed and grass

Figure 5: River bed reed 'ikri' and grass

Figure 6: Brick and cement mortar

The design of the homestead caters to the family needs, occupation and size. The designs are such that they can be extended incrementally or modified over time depending on the context; are interconnected and flowing and thus foster a high level of interaction between people in the neighbourhood strengthening social networks; are comfortable keeping the homes cool in

summers and warm in winters; they are aesthetic and reflect people's culture and art; is responsive to the climatic conditions of the region; flows seamlessly into community spaces; etc.

Figure 7: Living, sleeping and store room, kitchen

Figure 8: Verandah that doubles as kitchen and open space

Figure 9: Family Unit with space in the middle fostering privacy as well as interactions

The designs and layouts of entire villages that grow organically over the years usually have a meandering layout and the streets and paths converge or at least lead to a community building – typically a temple, that would normally have a solid structure, deep foundations, thick walls and high roofs with several openings; or a common meeting space usually under a large tree. Houses are arranged, along these lanes, in a slightly staggered fashion both with regard to their location on ground as well as location of the main opening. As a result, the main entry of one house

would normally overlook the open space of the house opposite. While this type of a layout has a strong social logic in terms of privacy when locating main entrances, or religious as in the case of the lanes terminating at the temple, there is strong logic also in terms of promoting a comfortable living environment with respect to movement of air, being visually pleasing, and enabling social interactions with one's neighbours[14].

The construction of houses and the design of layouts also allow for trees and other natural elements – undulation, water bodies, water channels etc. to remain undisturbed.

Figure 10: Ramnad, Tamil Nadu: meandering spaces

Figure 11: Mahapur-Punarvas, Saharsa District, Bihar; a meandering layout with a variety of house typologies

The techniques and technologies range from the simple to the complex – simple methods of tying together various elements of structure (in a simple hut) to the complex systems and methods of habitat management and disaster response and reconstruction.

Figure 12: Roof Support

Figure 13: Bamboo joineries

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[14] Mona Chhabra Anand, Architect, in a dialogue about village layouts with Radha Kunke

People have responded to and developed simple and elaborate mechanisms to adapt to and deal with vagaries of nature over the centuries – whether it is the intense heat of summers, bitter cold of the winters, floods and disasters during monsoons, or even the unexpected large scale destruction through earthquakes. In a country like India, which is predominantly rural, people have enjoyed a relatively self-sufficient style of construction and living. It is clear that there has been a Built Environment Swaraj.

In the reconstruction context however, people have waited for the government to respond to their situation and to 'build for them'. This 'dependence' on the government and the idea that the government will 'solve' all problems has led to a variety of disappointments over different disasters. While sometimes they have been helped adequately by the external interveners, most often the people themselves had to finally get to the brass-tacks and deal with their problems themselves.

In the post-tsunami reconstruction in Tamil Nadu, once the reconstruction of the core-houses was over, people moved in and started to modify these houses according to their requirements. Additions were made in the form of kitchens on the outside, thatched roof pandals on the roofs, shelter for cattle, kitchen gardens, sit outs etc. They used those materials which lay as waste or materials still lying around for features left incomplete and also locally available natural materials.

In Gujarat, where people were given a choice by the government and funds were made available to them to build the way they wanted, reconstruction saw a variety of designs, technologies and materials. 95% of the people who opted to build their own house used artisanal methods. Yet, the people who opted for NGOs to build their houses asked for concrete boxes. The message there was clear. 'If you are going to give me money or spend it on me, yes, I would like to have a concrete box. But if I have the money in my own hands, I have other higher priorities than a fancy idea of a concrete roof.' (Sandeep Virmani, Architect, Hunnarshala)

One of the reasons frequently given by the implementers of reconstruction - government, contractors or NGOs alike - is the need for speed, efficiency and being cost-effective in the interventions. However, in contrast we saw that when people build themselves, they use local materials, reuse waste materials, recycle materials from their old homes and do this so that the cost of building a house comes down. The situation is the same during reconstruction. When people are given money to build their own house, they build it in the most cost-effective manner, recycling and using as much materials as possible. This leaves them a little 'extra' cash which they utilize elsewhere. The speed of building also becomes remarkably faster. In Hunnarshala's experience - recounted by Sandeep Virmani in his interview on Sustainable Construction - in Jammu & Kashmir earthquake, the Government developed a policy and announced a scheme wherein if people completed their houses before the first snowfall, they would get an additional Rs.5,000/-. Seven thousand interim shelters came up in just 25 days. And by the time the snowfall actually happened, 20,000 shelters were completed!

8. Conclusions & Recommendations

Unlike other species which restrict their built environment to essential instinctual living needs, *homo sapiens* has architectured a built environment around them to cover more than just survival and livelihood. An entire familial, community, economic and cultural edifice is sought to be created with the aim of living more comfortably, safely and meaningfully.

As the planet reaches the tipping point in many fields like fossil-fuel-based energy, climate change, mineral based goods etc., it is quite clear that we have a built environment design failure on our hands. Our environment is dirty and polluted – the air we breathe, the water we drink, the food we eat. Our living environments – homes, work places, leisure places – all are stressed to the extreme. Our poor and vulnerable live in conditions of extreme poverty, fear, and ill-health while our rich live in conditions of extreme luxury. Our post-modernistic architecture has become uniform, reducing every city to look alike, insulating people from nature completely. Our engineering has become more and more complex. Our technology has become more and more resource-hungry and consuming. Our construction industry that guzzles cement, iron and steel, bricks and stone, energy and water is responsible for 22% of the world's carbon emissions among other polluting gases. Our large scale 'creations' have created urban conglomerations and settlements that create vast divides between people, where it penalizes the vulnerable (the children, the disabled, the poor, the old) and rewards only those with material wealth with luxury spaces and products. And as we look around, we wonder is this the meaning of being comfortable, safe, productive and creative?

If success is to be measured in terms of achieving objectives, then the primary objective of built environment has been completely unmet and thus we have totally failed. For more than half of the population on earth, life is neither comfortable nor safe nor productive nor enjoyable, while a majority of the rest leads an uneasy and uncomfortable life. And this is not even considering the other aspects of the planet including other living organisms on the planet – several of which are on the brink of extinction and almost all of them are under severe stress of contracting habitats – a direct result of human built environments.

With huge emphasis being given to issues of sustainability, especially in the light of Climate Change and especially as 22% of carbon emissions comes from the construction industry alone, the question of sustainability in construction is rapidly coming to the forefront. Many debates have been held, questions raised and solutions have been posited. Unfortunately most of these solutions have been "technical" in nature - sustainability in Built Environment has unfortunately come to mean either a technological response in "green" solutions or in an economic response in "low-cost alternatives", both falling far short of the current requirements.

It is clear that though these may go a little way to solve some of the energy consumption / efficiency problems, it cannot be possibly be posited as a *theory of ethics* in Built Environment. For real sustainability and ethical response to be achieved, we need to have major modifications in the mindset, in the attitude and the world-view of the stakeholders who engage with Built Environments. And this actually means almost every 'stake' as the built environment involves practitioners from every field: finance, materials, markets, design, planning, engineering, sociology, governance, law and so on.

With most of the decision making processes being taken away from people's hands on one hand, and on the other, contradictorily, devolution and decentralization of powers through mechanisms like Panchayat Raj etc. happening, the message is confused and has led to more conflicts than solutions. What one begins to see is a larger pattern – where the decision-making powers of crucial and large-scale issues are taken away from the people into the hands of the few powerful

stakeholders and at the same time the mechanical 'implementation' decisions of such centralised decisions are being devolved.

One also sees in this kind of dispensation a co-option of people's organizations and other public-oriented systems into playing an implementing role in a manner that makes dissent almost impossible. The question of participation and democracy in such scenarios become directly a concern for the Manifesto.

Though Civil Society Organizations have played dynamic roles in development and more specifically in reconstruction, with CSOs being seen as the tenuous link between people and the government, their role is being fast diluted in the recent years. Despite the government's 'recognition' of the CSOs and investing them with a seemingly credible role of being a interface between the two i.e. the people and government, the positions are pretty much clear and lines have been clearly drawn – that the government, in collusion with stakeholders on its 'side' will be the final decision maker, with CSOs seemingly being able to influence their decisions to a certain extent. The People very clearly are the 'recipients' of these decisions and are given some apparent powers to decide within a framework already decided on behalf of them. The question then arises: do the CSOs see the long term patterns of co-option and being the uneasy 'partners' of such implementation?

In this kind of a scenario, the ideas like Owner Driven Reconstruction (ODR) seem like progressive decisions that have been made by the authorities. Yet, is the decision for ODR more to make large-scale reconstruction easier for the government? How genuine is its concern for an Owner Driven construction when the building codes and bye-laws in the mainstream are diametrically opposite and do not support traditional knowledge systems and people's design and architecture?

Initiatives like ODR also become ineffective when faced with reconstruction that comes directly as a result of technological, man-made disasters – like the Kosi embankments. Here is a case of a technology solution that has never been able to solve the larger problem in the first place and on the other hand, has only created an unmanageable problem that the local communities pay again and again for, through generations of being displaced, losing their lands and livelihood and homes.

The question of the seriousness of people's participation and knowledge comes to the fore when one sees that in the larger dispensation, especially in the educational institutions, formal academic institutions and the research organisations, such knowledge systems barely get a mention and sometimes are even dismissed as 'unsafe' and not useful, while at the same time the disastrous technology solution get perpetuated as the best. How does one reconcile such contradictions? The problem in the technological solution is because science posits a solution to a problem under either a controlled environment like a laboratory or to respond to a problem situated in a specific set of inter-related dynamics of people and environment. These solutions cannot be 'standardized' as the problem definition changes with even a minute change in the dynamics of the inter-relations of the components at the ground level. However, locally arrived at solutions in response to a locally defined problem always comes trumps up in comparison. Yet, technology and science have always been posited as a solution at a "higher" and "larger" scale, which gets imposed at the ground however inappropriate it might be locally.

Under such circumstances, CSOs and their 'alternative technologies' and people and their traditional systems become severely crippled in the face of the juggernaut of 'modern' construction technologies that are either imported or are pushed and lobbied by technology monopolies. How is it possible for people's knowledge to find its rightful place and who will make it happen?

It may not be possible to bring in 'new' thinking; however, what can be made possible is to change the process of problem-definition and to make the people directly involved responsible for defining the problem. Once the problem is defined appropriately and articulated directly by the 'affected' and there is a genuine desire to meaningfully intervene, an appropriate solution becomes a natural outcome. One has to be very careful in being able to balance the interests of the different communities and stakeholders and facilitate a process of dialogue. Hence one of the strongest principles in reconstruction has to be that the affected people, community, village, family will define its problem and arrive at solutions that are most suited to them. And this kind of an approach has to be a policy approach where the government very clearly plays a 'facilitation' role and leaves the decision making and implementation to the people. Traditional techniques, modern approaches, alternative technologies and materials, fusion approaches - all of these then become part of the reconstruction response, engendering a holistic, plural, sustainable approach.

Once the government, the scientific community and the CSOs are clearly seen as 'facilitators' and as providers of the support that is required to enable 'good' reconstruction, the dependence of people on these stakeholders reduces drastically, squarely putting the power and responsibility of intervention in their own hands. This automatically ensures quality, speed, efficiency, plurality, justice and sustainability.

Recommendations:

There is no separate sub-discipline that articulates Ethics in Built Environment. This needs to be opened for debate to enable an articulation of ethics based on plurality, sustainability, justice, *swaraj* and non-violence.

Reconstruction has pointers to what Ethics in Built Environment can be built upon. Learnings from reconstruction, the pitfalls and positive initiatives can become the basis for developing an overarching theory of ethics in built environment.

The larger policy decisions are being clearly being taken away from the people and are being made by the Establishment (government + expert combine) while the actual implementation of these decisions are being devolved as decentralized processes. This gap and trend has to be recognized and changed.

It is clear that when people build, their approach is different – they bring in plurality, sustainability, and justice. There is an urgent need to redefine "efficiency" to mean not only speed plus cost plus quality but also to include these elements. All the other stakeholders other than the People themselves need to play a facilitative role, providing support and other enabling factors. People need to be able to build for themselves.