

**POST-TSUNAMI RECONSTRUCTION IN SOUTH INDIA: LESSONS FOR HABITAT DEVELOPMENT**

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**Abstract**

**Tsunami disaster of 2004 resulted in unprecedented damage to lives and property across coastal areas of South India. Varied approaches were followed by different agencies guided by their agency mandates, socio-cultural context of reconstruction and policy frameworks provided by the State. This paper presents an analysis of twelve case studies from across the Tsunami affected areas in South India to derive lessons on 'good practices' for reconstruction policy and program design & implementation.**

**The case studies have been analyzed from the perspective of technical and social responses to needs of the people and how these have contributed to institutional capacity building, knowledge systems and environmental improvement.**

**In particular, the research attempted to understand good practices related to:**

- **Risk Reduction: structural strengthening, site planning as well as knowledge development.**
- **Contextual appreciation and response: cultural, climatic and local political appreciation; response to the need for timeliness and participation of affected communities.**
- **Social and livelihood concerns: concerns of gender equity, social disparities and vulnerabilities within sections of society; promotion of habitat-based livelihoods.**
- **Environmental responsibility: response to local ecological as well as national and global concerns of climate change and resource optimization in habitat construction.**
- **Institutional anchoring of systemic interventions: addressing long-term sustainability of efforts, growth and development through partnerships, institutional strengthening, capacity building, and knowledge support systems.**

**These have provided the basis for identifying guiding principles for a practical and futuristic habitat planning approach for reconstruction.**

**Keywords:** Habitat Reconstruction, Environmental Sustainability, Institutional Strengthening, Habitat-based Livelihoods, and Alternate Technologies

**Introduction**

Shelter reconstruction is a major component in any post-disaster rehabilitation. It is also the most visible and possibly the most resource intensive component that forms a crucial bridge between relief and long-term development processes. Quality of housing and habitat can be safely expected to have a long lasting impact on the lives of the disaster affected families – not only in

terms of the quality of physical spaces but also in terms of how these spaces facilitate up gradation of socio- economic status and enhancement of skills and capacities of the families. Safe, adequate shelters and basic infrastructure provide the security and confidence to communities to address their core requirements of livelihoods, education and health. Habitat development processes can aid in community bonding and cooperation that are critical for future management of development processes.

Shelter reconstruction processes crunch the time frames of housing development that would otherwise take ten to fifteen years into two to four years. This is of prime concern, especially as large-scale post disaster shelter reconstruction results in extensive consumption of material and energy resources in relatively short time frames. Thus the relevance of environment friendly construction is gaining currency even in post-disaster contexts.

Within four to five months of the South – Asian Tsunami disaster in 2004, various agencies in India initiated reconstruction of permanent shelters in the affected states. Issues of relocation, land and the immense task of rebuilding infrastructure as well as housing dominated the rehabilitation phase. Given the country’s experience in disaster rehabilitation in the last decade, reconstruction was seen as an opportunity to "build back better" by most governments and organizations. Along with provision of safe houses, the rebuilding process was used as an opportunity to enhance overall quality of life through provision of basic amenities such as drinking water, sanitation; development of infrastructure such as roads, drainage, waste management facilities, community facilities of schools, child care centres, health facilities etc.

With over three years of habitat reconstruction programmes implemented by a profusion of international/state actors - a wide range of good practices emerged in the area of disaster-resistant, low-cost, and context-specific construction. Lessons from these are important to inform government policies on housing, disaster mitigation, and approaches to pro-poor and equitable infrastructure.

## **Research Methods**

The study was carried out by a team of researchers and documenters from **basin-South Asia Regional Knowledge Platform**<sup>1</sup> and its partner organizations under an initiative of the UNDP DRM team. It involved desk research as well as first hand studies of the identified cases, meetings with representatives of the affected communities, government functionaries and implementing agencies. It is important to note that the study was designed as an attempt to derive qualitative lessons from reconstruction mainly for habitat rather than being a scientific examination / evaluation of the processes involved in reconstruction and their results.

The projects were identified through a process of nomination called by UNDP from various stakeholders – governments, NGOs, UN agencies, and academicians. Of the agencies that had responded to the call for nomination and request for details, projects were further analyzed and selected for good practice case studies based on parameters set out by UNDP and technical experts in the research team.

The selected cases are by no means the only good practices. Many more nominations were received by UNDP and the selection represents only a fraction of the wide-ranging initiatives. The selection process was restricted by the need to cover different affected geographies, diverse approaches as well as limitations of available time.

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<sup>1</sup> **Basin-South Asia Regional knowledge Platform (basin-SA)** is committed to “developing knowledge systems and promoting collaborative action within South Asia to enable access by the poor to sustainable habitat and livelihoods”. For details refer [www.basinsouthasia.net](http://www.basinsouthasia.net)

The study team referred to information about state level policies of reconstruction in the post Tsunami scenario and also to documents made available by the project implementing agencies, government offices and UNDP.

### **Research Objectives**





The case studies have been examined from the perspectives of technical and social response to the reconstruction of shelter and its contribution to institutional capacity building, knowledge systems and environmental considerations for a safe and sustainable habitat development. In particular, the study attempted to understand the following aspects within the case studies:






- Risk Reduction - structural strengthening, site planning as well as knowledge development.
- Contextual appreciation and response - cultural, climatic and local political appreciation. Response to the need for timeliness and participation of affected communities in the process of their habitat redevelopment along with systems and processes for long term growth and expansion.
- Social equity - concerns of gender equity, social disparities and vulnerabilities within sections of society. Promotion of greater harmony and equity through form and process of habitat development.
- Environmental responsibility - response to local ecological as well as national and global concerns of climate change and resource optimization in habitat construction. Addressing the critical issues of ground water pollution and environmental management through appropriate technical and institutional solutions.
- Institutional anchoring of systemic interventions - Addressing longer-term sustainability of efforts, indeed growth and greater development in a sustainable direction through partnerships, institutional strengthening, capacity building and knowledge support systems.




Shelter reconstruction holds a strong potential for ushering in long-term development. This is particularly important for regions that are vulnerable because of an “institutional neglect” or oversight with regard to development. Disasters finally bring them onto the centre stage of the development agenda. Case studies in this research highlight the fact that reconstruction initiatives go way beyond; they are the building blocks for future development of the habitat as whole.

Projects in table 1 were studied for deriving lessons for habitat development.

**Table 1. Summary of the Projects Analyzed in the Article**

	<b>Project, Location</b>	<b>Description</b>	<b>Representative Picture</b>
1.	Reconstruction of 133 houses and repair of 110 houses in three districts of Andaman & Nicobar Islands by Action Aid	Highlights the possibility of influencing existing policies towards a more locally appropriate reconstruction response.	
2.	Reconstruction of 286 houses in four districts in Andaman & Nicobar Islands by CARE India and partners	Demonstrates a mutually supportive relationship between the government and the civil society for effective reconstruction.	
3.	Reconstruction of 124 houses for tribal and dalit families in Nellore district in Andhra Pradesh by Cultural Association for Mass Education and Liberation (CAMEL)	Highlights the possibility of addressing the special needs of children to achieve living environments that are safe as well as comfortable for all age groups.	
4.	Reconstruction of 69 houses in Aalappad Panchayat, Kollam district of Kerala by Communist Party of India (Marxist)	Shows how a political entity can work for the public good and successfully collaborate with other stakeholders for promoting sustainable technologies in reconstruction.	

<p>5. Reconstruction of 145 houses of Aalappad in Kerala by Malayala Manorama (a local daily and publishing house)</p>	<p>Demonstrates how Corporate Social Responsibility by an agency can help in leveraging support from other stakeholders. It also demonstrates the possibility of promoting social equity through a policy response.</p>	
<p>6. Sustainable Reconstruction of 909 houses in three settlements in Karaikal, Pudducherry by Development Alternatives (DA)</p>	<p>Demonstrates a sustainable response to the rehabilitation needs of three villages by way of contextual planning &amp; design, introduction of environment friendly construction technologies and institutional strengthening.</p>	
<p>7. Reconstruction of 97 houses in two villages in Kanyakumari, Tamil Nadu by Architecture and Development</p>	<p>Demonstrates how homeowners can be made partners in achieving the desired quality in reconstruction efforts.</p>	
<p>8. Construction 140 houses in Kodyampalayam village in Nagapattinam by Centre for Environmental Education (CEE)</p>	<p>Demonstrates how systematic introduction of appropriate construction systems, thoughtful planning and construction management decisions can lead to a safe and eco-friendly habitat development in a cost effective manner.</p>	
<p>9. Reconstruction 82 houses in Pillumedu village in Cuddalore district, Tamil Nadu by Centre for Rural Education and Economic Development (CREED)</p>	<p>Shows how the community can take pride in its settlement and be effectively involved in reconstruction of their homes.</p>	

<p>10. Owner based reconstruction of 1302 houses in four villages in Nagapattinam, Tamil Nadu by South India Federation of Fishermen's Societies (SIFFS)</p>	<p>Demonstrates the potential of a collaborative approach to reconstruction between the prospective home owners and technically qualified professionals for surprising and satisfying results</p>	
<p>11. Reconstruction of 828 houses in Akkaraipeta village in Nagapattinam, Tamil Nadu by Tata Relief Committee</p>	<p>Demonstrates how local constraints can be overcome using innovative methods, and how the advantages of urban design can be adapted to a rural / semi-urban context.</p>	
<p>12. Ecological sanitation initiative for 350 families in Kameswaram village in Nagapattinam, Tamil Nadu by Society for Community's Organization and People's Education (SCOPE)</p>	<p>Demonstrates the potential of use of ECOSAN - an emerging concept in sustainable sanitation through an intense engagement with the community.</p>	

The primary objective of “building back better” has been at the core of all the initiatives. Stronger, safer houses – along with basic amenities and infrastructure have been the hallmark of various cases across the states. In addition, in many cases, systemic interventions of long-term duration such as capacity building, knowledge dissemination, strengthening of local and district-level institutions provide a strong link between reconstruction and the longer-term development agenda in these areas.

## Research Results

The following lessons emerge:

### 1. Risk Reduction

*Location:* Risk-reduction begins with the choice and location of reconstruction site. Apart from the ongoing debate on the location and safety of settlements close to the coast vis-à-vis livelihood links with the sea, the availability of land was in itself a major issue in post-Tsunami reconstruction in South India. Implementing agencies attempted to ensure that low-lying lands were made fit for habitat development. Most agencies had to fill-up the land sites to raise the levels, some relocated new settlements at a ‘safe distance’ and or created ‘barriers’ and embankments to prevent seawater ingress. Although this exercise was indeed cost intensive and required structural and engineering inputs, it demonstrated the possibility of reclaiming low lying lands. This is significant at a time when across the country; millions of households have no access to social housing schemes because of the lack of suitable land.

However, the concerns of new vulnerabilities such as flooding and the settlement of artificially filled lands still need to be addressed by district planning and development authorities. At the regional level, concerns of natural drainage patterns, flooding of rivers and reduction of soil permeability and increase run-off also need to be taken care of.

*Structural strengthening:* Almost all projects studied have either referred to technical guidelines prepared by UNDP as in the case of Tamil Nadu, complied with BIS codes as demanded by the Government of Pudducherry or adhered to technical designs recommended by the Governments of the Andaman and Nicobar Islands, Andhra Pradesh and Kerala. Technical agencies have played their roles effectively in developing technical details, providing quality assurance and monitoring support. Guidelines, tools, technology and construction specifications and BIS codes have been used widely to comply with structural safety measures. Regulatory mechanisms for ensuring compliance with minimum safety standards in new and older settlements need to be further strengthened. The role of state and district Governments and village Panchayats needs to be clearly spelt out towards this end. Insurance agencies too have a role to play by providing cover to 'safe structures' thus providing an added incentive to strengthen the housing and infrastructure stock.

## *2. Social and Livelihood Concerns*

*Social inclusion in the process and form of habitat development:* In some cases, such as the experiences of A&D in Kanyakumari, CAMEL in Andhra Pradesh, ActionAid in the Andaman and Nicobar Islands, SIFFS and CEE in Nagapattinam and DA in Pudducherry, special efforts have been made to ensure that the real needy and most vulnerable are prioritized in beneficiary lists. Surveys, community-based selections comparisons between multiple lists from Government and Panchayat sources were taken up. Projects have lobbied for the inclusion of the under-privileged and the needy in the beneficiary lists and have worked actively with local leaders as well as district administration to bring about equity in the selection process. This highlights the role of civil society as watchdogs of social equity issues.

Interestingly, the Government of Kerala has had a lead role to play in this. Uniform designs, specifications and construction costs were to be followed by all the implementing agencies irrespective of their mission, political and social inclination or funds.

*Participation - Positioning homeowners as the prime movers of reconstruction:* Studies have established that disaster affected communities, even if they happen to be the most marginalized of the lot have the desire and ability to participate in the reconstruction process as partners rather than as mere beneficiaries. Women, men, children, the elderly and the disabled have effectively participated in settlement planning, house design, technology choice, material contribution, construction supervision, and even in the financial management and leveraging local linkages. The extent and nature of people's participation has depended upon their cultural and occupational background. While agricultural communities were found to be involved in the actual reconstruction of houses in bricks and mortar, fishing communities were involved mostly in the decision-making and not in the actual construction work. The success of participation has however been subject to the organizational inclination of the implementing agency, the skill and strength of the staff involved and above all the scale of the project.

Some of the key challenges faced in user participation are related to the nature of reconstruction itself. Existing local institutional structures, though potentially useful in facilitating community engagement, are also sometimes self-limiting. This is true especially in situations where participatory processes are perceived to challenge existing structures, hierarchies and social norms, as experienced by many agencies with the traditional Fishermen's Panchayats in Tamil Nadu and Pudducherry.

### *3. Contextual Appreciation and Response*

*Planning and design:* Reconstruction, as case studies have highlighted, is often carried out by agencies that are external to the local context and move in only for the purpose for a limited time frame. This situation limits effort and time that can be invested in undertaking extensive engagement with the user community. Most external agencies have overcome this limitation by employing local consultants, creating partnerships with local civil society agencies and most importantly engaging with the affected community. This has brought in the understanding and sensitivity to deal with local, cultural, climatic and life-style elements. Such partnerships need to be included as desirable elements in the design of response initiatives.

### *4. Environmental Responsibility*

*Sustainable construction practices:* In the current situation, where energy crisis looms large, the wisdom of energy-intensive design choices and materials is being questioned.

Projects implemented by CEE in Nagapattinam, Development Alternatives in Karaikal and A&D in Kanyakumari have proved that alternate technologies can not only be effectively put to use but also mainstreamed to a large extent through reconstruction projects. Even though these are small initiatives in themselves, collectively they help influence public opinion in favour of alternate technologies and systems.

Continued promotion of new technologies, skill building of artisans, application of new systems in public sector projects, performance standards and contracting procedures need to be mainstreamed. Technical agencies, along with state governments and construction agencies, need to come together on this issue. This would go a long way in promoting safe and sustainable habitats.

*Local ecological response:* Many projects designed responses to the area-specific issues of high water tables, depleted drinking water sources and solid waste management. Some of the projects have responded to the concern of scarce ground water resources by providing rainwater harvesting at unit or settlement levels. This was also mandatory in case of Tamil Nadu and Pudducherry. However, further research is required to refine and fine-tune the systems. All projects have struggled with issues of sanitation. Some interesting sanitation solutions for coastal areas have emerged as in the case of CEE and SCOPE. Most projects look forward to permanent solutions from the district Governments. Much research and ground testing is going on in this area and solutions like eco-san, DEWATS, percolation trench based systems are being promoted. States have the responsibility to ensure that the outcome of this research is put together in the form of technology guidelines and standards for sanitation are developed for coastal areas. Proper management of waste will ensure healthier habitats.

### *5. Institutional Anchoring of Systemic Interventions*

*Partnerships - leveraging stakeholder resources:* An interesting highlight of some of the case studies has been their success in leveraging / pooling resources from other stakeholders for reconstruction. The projects implemented by Malayala Manorama and CPI (M) in Kerala as well as the experiences of TRC, CEE and DA are good examples. Both case studies from Kerala tell us that financial support can be managed through local stakeholders. This not only promotes transparency, given the accountability of the implementing institution locally, it also ensures greater ownership and strengthening of local institutions. TRC, CEE and DA have not only brought in techno-social expertise from local partners, they have also managed to bring in technical solutions from sister concerns and partners for elements like solar energy installations in the TRC project and building materials based enterprises and landscape development in the DA project.



An interesting collaborative venture between the Government and civil society is seen in the CARE project in the Andaman and Nicobar Islands. The role of the Government in quality management is appreciated. In other states, the role of the district authorities in quality monitoring was extremely useful for compliance with norms and standards. However, guidelines, orientation and training of the supervisory staff, building material and water-testing facilities were not made available in the states except in a limited way in Tamil Nadu. This is an area where states need to create a resource pool that is pressed into service in times of need.

*Livelihood potential in shelter reconstruction:* The construction sector is the second largest provider of jobs after agriculture. Post-disaster reconstruction projects offer tremendous potential to create jobs and alternative livelihood opportunities. This is especially true in the case of building materials and elements that can be produced locally as has been demonstrated in many cases examined in this document. The experiences of DA and CEE show how large reconstruction projects provide a market for new elements from local production units and indeed can grow into profitable businesses that can supply building materials beyond project periods.

Similar potential is seen in the area of construction skills. Nearly all the cases had a component of training and skill up gradation of construction workers in safe building practices and alternate technologies. Many have directly worked through masons or petty contractors ensuring that these masons can provide better services and enhance their incomes. It is now required that a systematic database of trained masons be maintained at the local level, systems of certification are established and trained artisans are linked to future construction works. Many agencies have brought in trained masons from other parts of the country to supplement the human resource as well as to impart on-job training by example to local masons. The pool of masons, so created in South India can now be used in other regions as well.

*Improving habitat practices and trades:* There is tremendous potential in influencing mainstream habitat practices and allied trades through the practices demonstrated and targets accomplished in various cases. This relates to the training of masons, contractors, and Government engineers and agencies connected with construction activities. UNDP support in Tamil Nadu has shown a way of systemically addressing this issue through the creation of Technical Resource Centres, training systems and large-scale orientation of technical human resource with respect to safe and sustainable construction practices. The large-scale demonstration of improved quality, safety features and sustainable construction technologies now available, can be benchmarked for future development. Trained personnel should be engaged actively in habitat development in the regions during non-disaster situations. This will substantially improve the quality of housing stock.

*Role of the State in reconstruction:* In the event of a disaster, the role of the State is primary. It is responsible for ensuring that principles of good governance and justice are upheld and the rights of all the disaster victims are defended. It is responsible for promoting safety, security and functionality of settlements created or reconstructed. The policy environment in various states affected by the Tsunami has been discussed earlier in this publication. State Governments have drawn important issues from previous post-disaster reconstruction projects in the country. For instance, all state Governments had prescribed technical guidelines for constructing structurally safer buildings. What the Governments of Tamil Nadu and Pudducherry laid down are the minimum standards for habitat planning and house design in terms of facilities and broad area specifications. Similarly, the Government of Kerala has provided standard designs for implementation.

The Government of Andhra Pradesh could subsume the reconstruction activities with small adjustments of its ongoing Rural Housing Program. This demonstrates the ability of states to deal with new challenges through existing institutional systems.

## Discussion and Conclusions

### *From Shelter Reconstruction to Habitat Development - Key Imperatives*

Disaster-affected families lose 'homes'; implementing agencies in response, reconstruct 'houses and settlements'. There is a need to substantially enhance the quality of settlements that are reconstructed and bridge the gap between 'shelter' and 'habitat development'. The following imperatives emerge:

*Integration of habitat agenda with reconstruction guidelines:* Families affected by disasters not only need living space, they also need 'homes' where women, men and children can live with dignity, have access to basic services and infrastructure and are able to pursue their education, livelihood and household chores without facing impediments. The quality of settlements can only improve if the lowest minimum denominator for reconstruction changes from a 'house' to a 'settlement'.

In order to take this forward, it is important to integrate guidelines for habitat planning along with technical guidelines for safe construction practices enforced by the Government. Implementing agencies also need to internalize this as a part of their reconstruction agendas.

#### *Focus on long-term systemic change for linking reconstruction with development:*

The link between reconstruction and development is clearly visible in the approach adopted by many implementing agencies. Use of various tools for community engagement, training materials, checklists, and standard operating procedures should be mainstreamed even outside the reconstruction context. More importantly, institutional machinery for habitat development should be bolstered so that local institutions have a much clearer role in reconstruction. In this manner, local ownership of reconstruction as well as quality of habitats can be enhanced substantially. It would also be useful in reducing the vulnerability of habitats to disasters.

*Strengthening community institutions:* Significant lessons emerge for strengthening people's processes in habitat development. Programs and projects need to graduate from fostering mere participation in reconstruction to sharing responsibility for management and maintenance of new assets by local communities. Capacity-building of local resident committees to represent community interests, monitor construction quality and even manage the construction and finances needs to be brought out in the form of guidelines and tools for future initiatives. The potential of these resident committees in managing new assets and lobbying for habitat infrastructure development needs to be explored and possibly institutionalized.

Enabling mechanisms, such as allocation prior to construction, inclusion of community groups in design processes and sharing local area development priorities will help local communities take greater responsibility in post-project maintenance.

*Investment in demand creation for safe habitats:* Finally, a safe habitat approach needs to be integrated with the mainstream as a preparedness measure. While knowledge with regard to 'what is safe' has been shared with the affected communities, this knowledge needs to be spread and enforced across the entire coastal belt; particularly amongst home owners, construction agencies and local and district level regulatory bodies. Local building centres, technical agencies, village panchayats and civil society linked to centres of information and knowledge on safe construction supported by the state governments need to be set in place. Moreover, manpower trained in safe construction practices and alternate technologies through reconstruction projects need to be absorbed in the mainstream so that the skills acquired are not lost and are gainfully applied in making new constructions safe.

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## Author's Biography



**Zeenat Niazi**, Vice President, Development Alternatives Group. Trained as an architect, Zeenat holds a Bachelor's degree from the School of Planning and Architecture, New Delhi and a Master's degree from McGill University in Canada. Zeenat has over twenty years experience of extensively working in the field of habitat processes and housing technology. She has undertaken several projects for the design of habitat processes in both non-emergency and post disaster situations. She is passionate about dissemination of large-scale environmental friendly housing technologies in rural and urban areas and has contributed towards national policy development for rural housing and habitat in India through her engagement with basin-South Asia as well as in her capacity of member of several Working Groups of the Government of India and its Agencies over the last seven years.

**Mona Chhabra Anand**, Director, Knowledge, Works. Trained as an architect, Mona holds a Bachelor's degree from the School of Planning and Architecture, New Delhi and a Master's degree from the Development Planning Unit of University College London. Mona has over thirteen years experience of working on various issues in relation to access to housing by the rural poor in both development and disaster contexts. She has extensively been engaged in policy research on housing and habitat development in India. Mona is passionate about knowledge solutions for sustainable habitat development especially in disaster preparedness and response and pursues this through teaching and consultancy assignments.

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