From Gujarat to Tamil Nadu: Owner-driven vs. contractor-driven housing reconstruction in India

Jennifer Duyne Barenstein, World Habitat Research Unit, University of Applied Sciences of Southern Switzerland
email: Jennifer.duyne@supsi.ch

Summary

The beginning of the 20st century was marked in India by two major disasters. In January 2001 a severe earthquake stroke Gujarat. Less than four years later the Indian Ocean tsunami hit coastal Tamil Nadu. The two states' reconstruction process varied significantly. In Gujarat affected communities could choose between different agencies and approaches. This led to 87 percent of the reconstruction being owner-driven. In Tamil Nadu reconstruction pursed a top-down approach and was mainly contractor-driven. What are the causes and what are the consequences of such different reconstruction processes? This paper is based on a review of secondary data, policy documents and empirical research in Gujarat and Tamil Nadu. In Gujarat we found that owner-driven reconstruction achieved the highest level of satisfaction among all categories of people and was the fastest and most cost-effective reconstruction approach. In Tamil Nadu housing reconstruction was socio-culturally and environmentally insensitive. The research revealed a number of perverse 'side-effects' of contractor-driven reconstruction combined with over-funding and prejudices towards local housing culture and building practices, such as the systematic demolition of undamaged and reparable houses to gain land to build new houses and the massive cutting of trees. These interventions transformed the natural habitat and built environment of coastal Tamil Nadu beyond recognition with detrimental effects on coastal communities' social cohesion, resilience, and wellbeing.

Keywords: owner-driven and contractor driven reconstruction, social and environmental impact of reconstruction

Introduction

Many agencies assume that the quickest and most effective approach to rebuild houses and re-establish normality after a disaster is the employment of professional construction companies. Nowadays, however, there is a growing awareness among experts and humanitarian agencies that this is not necessarily the case (Barakat 2003). Construction companies tend to build standard houses that do not respond to the specific requirements of the families for whom they are intended. When construction materials and expertise are imported from outside, target communities

may find it difficult to face future repair and maintenance needs. In most countries the construction of a house is not a one-shot activity and people keep making additions as to adapt them to their changing requirements and socio-economic status (Davis 1981, Oliver 2003). If people were not involved in their houses' initial construction, they may fold back on unsafe building techniques, which may be the main cause of the disaster that rendered them homeless (Twigg 2006). Villages reconstructed by professional companies generally consist of grid-patterned row houses that pay little attention to communities' social organisation and settlement patterns. Such a disruption of communities' spatial organisation may negatively affect their social cohesion and livelihoods (Downing 1996; Oliver-Smith 1990). Occupancy rates of houses constructed by external agencies often remain low as people refuse to move in. Whenever possible, people may prefer to repair their old and damaged houses at their own expenses, leading to impoverishment and to a massive waste of resources (Davis 1997).

The drawbacks of a contractor-driven approach towards post-disaster housing reconstruction led humanitarian agencies to consider alternatives. Some NGOs adopted participatory approaches, which appear to be more cost-effective and more empowering than contractor-driven reconstruction. In such cases the agency keeps a leading role in construction but the community is involved in variable degrees and roles in the construction process. The meaning given to participation however varies significantly from case to case; communities may be involved in decision-making throughout the project cycle, including the house design and the selection of construction materials. Their role, however, may be limited to the provision of unpaid labour or to a swift consultation of community leaders (Davidson et al. 2007). A step forward in empowering the house owners that is increasingly advocated by leading international agencies including the UN Habitat and the World Bank and the International Federation of Red Cross Societies (IFRC) consists in the so-called owner-driven or community driven approach (UN Habitat 2007, IFRC 2007). Under this approach people are enabled to reconstruct their houses by themselves and the role of external agencies is limited to the provision of financial and technical assistance. Owner-driven reconstruction appears to entail a number of advantages: it is more cost effective, building may be incremental allowing occupancy already before the house is fully finished, and occupancy rates tend to be significantly higher. Encouraging active participation of disaster-affected communities in construction may be an effective strategy to restore confidence among people who have gone through the traumatic experience of a disaster. Building activities provide structure to the day and can keep large numbers of community members gainfully occupied. An owner-driven approach allows people to reconstruct their houses according to their individual requirements and preferences and may strengthen local building capacities. With adequate financial and technical assistance, self-built houses are likely to be more sustainable and people may be in a better position to make extensions and repairs (Barakat 2003). An owner-driven approach may contribute to preserve the local cultural heritage and vernacular housing style, which are instrumental for a community's cultural identity. This is particularly important for people who have gone through the devastating experience of a disaster (Oliver-Smith 1996, Davis 1997). However, owner-driven reconstruction also entails some risks. Without an adequate regulatory framework, the enforcement of building codes, access to good quality construction materials, technical guidance and supervision people may not be able to reduce their vulnerability by building safe houses. There is also a risk that vulnerable people such as widows and elderly people, without adequate support mechanisms do not have the capacity to manage construction on their own.

Humanitarian agencies' preference for one or the other reconstruction approach is rarely based on research on outcomes and impacts of different approaches. Indeed,

in spite of the substantive volume of financial resources invested in this sector, there is a paucity of independent research on post-disaster housing reconstruction approaches and outcomes. This paper aims at contributing to filling this gap by presenting the findings of a number of interlinked research projects focusing on micro-level issues and perspectives of post-disaster housing reconstruction in Gujarat and Tamil Nadu[1].

Research methods

This paper is based on a number of inter-linked multidisciplinary research projects. In 2004 we conducted a comparative analysis of different housing reconstruction approaches that were pursued in Gujarat after the 2001 earthquake (Duyne 2006a). In-depth research was conducted in eight villages and participatory appraisals in another thirteen. Qualitative data on people's individual and collective views on different housing reconstruction approaches were collected through semi-structured interviews with key informants and with stratified samples of men and women, focus groups, and a detailed participatory assessment of housing designs and construction quality. The research also involved a household survey in six villages, covering a random sample of 15% of households (totalling 434 face-to-face) interviews. The tsunami that devastated coastal Tamil Nadu occurred just at the time when our research findings revealed significant advantages and preference for owner-driven reconstruction, but also international agencies' still prevailing lack of trust in people's building capacity. After a rapid appraisal in several villages in coastal Tamil Nadu in March 2005, we conducted a research on vernacular housing in Nagapattinam district with the aim of raising awareness about coastal communities' housing culture. Participatory appraisals in twelve villages allowed us to document the social and cultural dimensions of housing and the building capacity of coastal communities (Duyne 2005 and 2006b). We found that external agencies systematically ignored local knowledge and building capacity and that in many villages over-funding and lack of cultural and environmental sensitivity led to massive demolition of reparable and even undamaged houses. We followed up this issue through an action research focusing on the reparability and upgrading potential of pre-tsunami houses with a systematic participatory damage assessment in two villages in summer 2006. At the same time we also revisited the twelve villages were we had conducted research in September 2005 and assessed –through individual and group interviews and observation– the ongoing reconstruction process. This was followed by another one-month research in March 2008 in the same villages we had surveyed before. Our research on post-disaster reconstruction in India is still ongoing and we are planning another round of fieldwork in October 2008.

The reconstruction experience of Gujarat: a case for owner-driven reconstruction

The context

On January 26th 2001 Gujarat suffered a devastating earthquake of a magnitude of 6.9 on the Richter scale. The quake was the worse experienced by India in the last fifty years. About 20,000 people lost their lives, 167,000 were injured, and over one million were rendered homeless. 344,000 houses were completely destroyed and

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888,000 reported damages. (UNDP 2001; WB/ADB 2001). Two weeks after the earthquake the State Government constituted the Gujarat State Disaster Management Authority (GSDMA), which announced its rehabilitation policy only a few days later. It proposed relocation of the most affected villages, assistance for in-situ reconstruction of severely affected villages, assistance in less damaged areas for repair and in-situ reconstruction; and assistance for modern buildings in urban areas[2]. The policy was based on the one followed by Government of Maharashtra after the earthquake in 1993. However, whereas in Maharashtra eight years earlier there appeared to be a high societal consensus about the proposed reconstruction policy this was not the case in Gujarat, where it met with stiff public resistance (Gupta 2002; Pathak 2001: Enarson 2001b). Prominent public figures, including the former Deputy Commissioner of Latur district, warned the Government of Gujarat from repeating the same mistakes. 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, as opposed to the "contractor-driven" approach that was followed in Maharashtra (GSDMA 2002). 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 the option 87 percent of the people opted for financial compensation and to reconstruct their houses on their own (Abhiyan 2002). The government's abandonment of the relocation-cum-adoption policy had a number of implications for international NGOs and private corporations, which at that time had already developed their adoption plans and were visiting villages with promises of different kinds of 'ready-made' villages. Some adapted to the new policy scenario and embraced self-help construction programs by supporting communities who opted for financial compensation through additional construction material, training and technical assistance. Many international NGOs and private corporations, however, proved to be less flexible and went ahead with the same village adoption-cum-contractor driven approach they had followed eight years earlier in Maharashtra (Duyne 2004). Owner-driven reconstruction and financial assistance is currently advocated by many international agencies and experts. At such a large scale, however, it may never have occurred in disaster recovery history before. At its early stage the experiment attracted the media and a number of scholars who were rather skeptical about the government's intentions and about the viability of its reconstruction approach (Enarson 2001a and 2001b; Wisner 2001b). Jigyasu for example, who was equally critical about the contractor-driven relocation approach followed in Maharashtra, expressed his concerns about the possible social implications of the Gujarat post-earthquake reconstruction policy (Jigyasu 2001b and 2001c).

Housing reconstruction in Gujarat: citizens' perspectives

Reconstruction in Gujarat involved a large number of national and international agencies with different approaches towards reconstruction. Our research focused on the outcome of five representative approaches. A brief context-specific definition of these approaches is given in Box 1.

[2] Cf: URL: http:// www.gsdma.org

BOX 1

Housing reconstruction approaches in Gujarat

Owner driven approach (ODA): Under this approach the house owner was given financial compensation ranging from a minimum of 40,000 Rs to a maximum of 90,000 Rs for a fully damaged house, depending on the size and value of the original house. The money was released in three instalments. An engineer was placed in each village to provide technical assistance, supervise the work and authorize the disbursement of the next instalment based on qualitative and quantitative achievements. The house owner was responsible to hire masons and purchase the construction materials. He was free to choose his own house design and materials as long as he respected building codes for seismic safe construction endorsed by the Government. This approach was pursued by the Government of Gujarat within the framework of the World Bank funded Gujarat Emergency Earthquake Reconstruction Programme (GEERP). Over 197,000 houses corresponding to approximately 87% of the fully damaged houses were self-reconstructed with this approach.

Subsidiary housing approach (SHA): It refers to the housing assistance approach pursued by several Gujarati NGOs that were active with various livelihood programmes targeted at socio-economically disadvantaged communities in remote areas of Gujarat already before the earthquake. Out of persuasion that NGOs should assist citizens to get access to their entitlement rather than replacing the state, these NGOs consciously assumed a subsidiary role by complementing government compensation with some additional material and technical assistance. Our case study refers to two remote hamlets in Kutch district that were assisted by a local NGO with the provision of construction materials for a total of 25,000 Rs per household and some technical guidance, which they received on top of the government compensation.

Participatory housing approach (PHA): Several NGOs in Gujarat actively involved their target groups in reconstruction. Our case study refers to the housing programme of an important Gujarati NGO with experience in low-cost housing for disadvantaged communities already prior to the earthquake. After the earthquake the NGO carried out its own damage and needs assessment and identified 30 villages for the reconstruction of 3000 houses. The NGO targeted its post-earthquake housing reconstruction programme only to the poorer households, who according to their view could not count on sufficient government compensation to restore or improve their housing on their own. The NGO adopted the concept of incremental housing and opted for traditionally used local construction materials (stone walls with cement mortar and tiled roofs). It trained and employed local labourers and also expected the house owners to participate in construction. At a cost of 47,000 Rs the NGO offered a core house unit of only 20 m^2 plus sanitary facilities. Our case study covers three villages in Patan district where the NGO supported the construction of over 700 houses.

Contractor-driven reconstruction in situ (CODIS): This approach was mainly pursued by large national and international NGOs. Our case study refers to a large Indian NGO funded by international NGOs that took over the full reconstruction of over 3000 houses in 11 villages. The NGO employed a large contractor who brought skilled and unskilled labour from outside, but reconstructed most houses *in situ*. The houses were built with reinforced concrete cement frame (RCC) structure with cement hollow blocks as walling material, and flat RCC roofing. The case study covers one village near Bhuj in which the NGO reconstructed a total of 800 houses. There was some degree of citizen's consultation in the finalisation of the housing design and people could choose between a number of different options. Participation in construction was not mandatory, but some households supervised the construction of their house and participated in curing. The cost of one housing unit under this approach was 85,000 Rs.

Contractor-driven reconstruction ex-nihilo (CODEN): This approach was adopted by large national and international NGOs and some private companies. Our case study refers to a large Indian NGO funded by several international NGOs that took over the full reconstruction of 11 villages with a total of 2250 houses. Besides

adopting a contractor-driven approach it was among the few agencies that in spite of massive public resistance to relocation constructed completely new villages *ex nihilo*. Our case study covers three villages in Jamnagar district in which the NGO reconstructed a total of 720 flat-roofed RCC houses. In these villages the NGO primarily interacted with the village leaders whose consensus was needed to adopt the villages for reconstruction, but there was no household-level participation. The families were handed over a house on a random basis or based on some other criteria decided by the village leaders upon their completion. With an average cost per housing unit of 124,000 Rs. this was the most expensive approach.

Our multi-sited research in Gujarat found that owner-driven reconstruction was the most cost-effective, fastest and according to citizens' the most satisfactory approach. As shown in table 1, the highest level of satisfaction was achieved with what we called the 'subsidiary housing approach' that is where people received from an NGO material assistance on top of the financial assistance from the government. In the concerned villages, everyone felt that their housing situation was better than before the earthquake. With regard to size, location quality of materials and quality of construction, 95% of the households were fully satisfied. This approach proved to be an effective way to mitigate some of the risks of the owner-driven approach pursued by the government, namely to neglect the special needs of the most vulnerable people.

Self-built houses in Gujarat

The government supported owner-driven approach was almost as popular as the subsidiary housing approach, with 93.3% of households reporting themselves as satisfied with their post-earthquake housing situation. Ironically, satisfaction was highest among those who obtained the minimum compensation of 40,000 Rs given for houses classified as 'fully damaged huts'. Their housing situation before the earthquake was generally poor and even the minimum compensation led to an improvement. People's positive judgement about the quality of their new houses was confirmed by our detailed observations, which indicated that the quality of construction was generally good and the houses were seismically safe.

The overall satisfaction levels with the participatory housing approach averaged 90.8%. The approach gave people an active role in the construction of their houses, and a say in the materials, design and location of the house. This led to houses that did not differ significantly from those reconstructed by the people themselves, under the owner-driven approach. The reason why the houses built with this approach were

less appreciated than self-built houses is that they were comparatively small and people were convinced that with the same amount of money they would have been able to build larger houses.

Table 1: Satisfaction with different reconstruction approaches in % (N = 434)

	ODA	SHA	PHA	CODIS	CODEN
Financial support per housing unit (in Rs)	40,000-90,000	40,000+ 25,000	47,000	85,000	124,000 (average)
Overall satisfaction with quality of housing	93.3	100	90.8	71.6	22.8
Satisfaction with…					
House location	99	95	96	95	64.5
House Size	90	95	85	89	51
Quality of materials	94	95	93	64	38.5
Construction quality	95	95	93	69	3.5
Average	94.50	95.00	91.75	79.25	39.37

Source: Household survey, December 2004-February 2005

The level of satisfaction decreased significantly when houses were built by contractors. Only 71,8% of the people who received a house built by a contractor *in situ* were generally satisfied and only 64% expressed satisfaction with the quality of construction materials. In fact the agency replaced local materials such as stones and tiles with industrially produced materials which are not suited to the local climate and the profit imperative of contractors was also hold responsible by many people for a low quality of construction.

Contractor-built houses in Gujarat

The least popular approach pursued in Gujarat was the most costly contractor-driven approach *ex-nihilo*. Only 22.8 of the people who received a NGO house built with this approach were satisfied and only 3.5% considered the quality of construction adequate. People also complained about lack of participation, elite capture of decision-making and project benefits, bald discrimination in favour of local elites and

the disruption of family networks caused by the relocation. Where people had the option of rebuilding their old houses they refused en masse to move to the new village. It is ironic that the project that enjoyed the lowest level of appreciation among its beneficiaries was the most expensive, with housing units costing around three times more than owner-built houses.

Gujarat's reconstruction experience proved that with adequate financial and technical support and other enabling conditions (e.g. good supervision, massive training of local masons, and subsidized construction materials) people have the capacity to build houses that are more likely to respond to their needs than houses provided by external agencies. People who managed by themselves reconstruction were able to move back to their houses earlier than those who depended on NGOs proving that the approach was not only the most cost-effective but also the fastest reconstruction strategy.

Citizens' satisfaction is a critical indicator for assessing the degree of success of reconstruction. Yet, there are other important issues that need to be appraised, such as the social and environmental impact of different reconstruction approaches. Also from these points of view we found several drawbacks of contractor-driven approaches. First of all, it was found that while self-built houses often made an extensive use of recycled and locally available construction materials, this was not the case of contractor-based reconstruction. Most contractors promoted the use of reinforced concrete cement (RCC), a construction material with a high environmental impact. Another environmental problem related to the use of RCC is the high requirement of water for curing, which is particularly problematic in semi-arid zones where over 85% of the reconstruction took place. In many places the water demand for construction competed with domestic and agricultural requirements leading to social conflicts. The quality of construction suffered due to lack of water, as curing was hardly ever done with sufficient care. Another problematic aspect from an environmental point of view is that most contractors privileged building on new sites, which led to significant losses of agricultural land. Damaged villages were simply abandoned, which also from a psychological and from a landscaping point of view is rather problematic.

Contractors proved to have a vested interest in maximising construction and often managed to create an artificial demand for houses. In Gujarat we found that contractor-driven reconstruction led to a massive increase of houses[3]. The new houses were not equally distributed among community members and influential households inevitably succeed in getting more houses. In the contractor-built sample villages covered by this study we found that it was not unusual for people belonging to dominant communities to have obtained 2-3 houses. Some people managed to secure for themselves as many as seven houses! This is one of the factors explaining the low occupancy rate, but also social tensions and conflicts.

From a socio-cultural point of view, it was found that contractor-driven reconstruction led to several negative impacts. Houses and settlements built by contractors strongly deviated from the local housing culture and were perceived as incompatible to local livelihoods. This is another factor that explains the low occupancy rate in some villages; many people rejected them and ended up building their own houses. However, as they had officially received housing assistance from an NGO, they were neither entitled to financial assistance nor to technical guidance.

[3] The increase in number of houses was found to be generally high, averaging 59%. It was however particularly high in contractor built villages where the number of houses raised by up to 83%. By relating the village population with the number of houses we found that only 5% increase of houses could be possibly justified in terms of pre-quake shortages.

Local consequences of contractor-driven reconstruction: the case of post-tsunami coastal Tamil Nadu

The context

On December 26th 2004 a severe earthquake measuring 8.9 on the Richter scale hit northern Sumatra. The quake resulted in one of the most powerful tsunamis of recorded history. In India the tsunami killed over 10,000 people, and approximately 5800 persons remain missing (GOTN 2005). The tsunami lashed over 2,260 km of India's coastline with waves of a height of 3 to 10 meters that penetrated 300 m to 3 km inland. Nearly 80% of the human and material losses concentrated in the state of Tamil Nadu. The vast majority of the tsunami victims belong to the coastal fishing communities.

Soon after the disaster the government estimated that over 130,000 houses needed to be reconstructed and about 10,000 needed repair. These figures were not the result of an accurate damage assessment. In fact, the first reconstruction policy issued by the government in January 2005 envisaged permanent relocation, which implied the need for new houses for all affected communities. Another factor that contributed to give little importance to a housing damage assessment was the assumption that 87% of the coastal people were living in '*kachcha'* (semi-permanent houses) and that reconstruction would be an opportunity to upgrade the housing condition of all (ADB et al. 2005).

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. Tamil Nadu's reconstruction policy had thus much in common with Gujarat's. However, whereas in Gujarat communities could chose between financial assistance and agency-driven reconstruction this was not the case in Tamil Nadu. Once the government realized that there were sufficient non-governmental agencies and funds to ensure housing reconstruction it withdraw 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. Activists and civil society organisations concerned about equitable and sustainable recovery thus fully concentrated on this issue, paying little attention to other factors such as the social and environmental implications of different reconstruction approaches. 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.

Post-tsunami reconstruction in Tamil Nadu could have been fairly quick and effective if it had not been complicated by the relocation issue, the immense media attention, the unprecedented availability of international private aid, and if it had pursued an owner-driven approach. Indeed, local communities had a strong housing culture and building capacity, the local construction industry was not affected by the tsunami, construction materials and skilled labour were locally available, and the number of houses that

needed replacement was significantly below the official estimates. 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 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 became the only criteria to assess the competence of external organisation in getting involved in reconstruction.

Reconstruction outcome in Tamil Nadu

When we last visited Tamil Nadu in March 2007 reconstruction was still ongoing and most people could not yet move in their new houses. Hence, it was not possible, as we did in Gujarat, to assess people's satisfaction with their new housing situation. The fully contractor-driven reconstruction process, however, revealed a number of highly sensitive issues with detrimental social and environmental impacts:

i) Demolition of undamaged houses

Preserving as much as possible of the pre-disaster built environment is extremely important from a psychological, socio-cultural, economic, and environmental point of view. This however, was neither recognised by the government nor by any agency involved in reconstruction. In the wake of the tsunami the government of Tamil Nadu promised new 'pakka' (concrete) houses to all affected communities.

Details of vernacular houses in Tamil Nadu

This promise was based on the assumption that most coastal communities would be relocated and that their housing situation was precarious already before the tsunami. Our appraisal in twelve villages in Nagapattinam district revealed that this was not the case. Though housing conditions were not homogenous we found that a significant proportion of households used to enjoy comfortable housing. Vernacular houses were well adapted to the local climatic conditions, environmentally sustainable, in harmony with the natural habitat, and beautiful.

This explains why many communities officially opted for relocation with the hope of ultimately possessing two houses. However, while agencies were eager to spend their funds and to show progress with reconstruction it turned out to be very difficult to find land for relocation. Agencies thus started pushing for reconstruction in situ, which was possible only by demolishing the existing housing stock. In our survey carried out in summer 2006 in two villages in Nagapattinam district, we found that out of 1500

houses an NGOs was planning to build, over 780 were going to replace good quality undamaged or reparable houses. This practice was legitimized by the government policy that promised 'pakka' houses to all tsunami-affected communities. Using these categories justified the demolition of all houses (approx. 70%) that had a thatched roof, an appropriate locally available low-cost material that under the local climatic conditions ensures the highest level of comfort (Duyne and Pittet 2007).

Two different types of thatched roofs inTamil Nadu

In another village we found that an NGO, eager to show progress to its funding agencies bulldozed 110 houses that had not been damaged and had already been upgraded by another NGO. Not all house owners were willingly relinquishing their houses but they were often forced to do so by their local leaders. The reasons for them to side with contractors were multiple. In some cases they were sincerely concerned about solving the housing problem of those rendered homeless. In other cases, there was evidence that they had been co-opted by the contractors who promised them all sorts of compensation in case they would cooperate in 'solving' the land problem. In some villages land was acquired by forcing people to surrender their homesteads and houses and those who tried to resist were excommunicated from their communities. Some NGOs considered those who were not willing to give up their ancestral houses in favour of a mass housing project as selfish. There is no doubt that for the poorer segments of fishing communities, in particular those who used to live in the housing colonies that were built for them by the fishery department some years earlier, tsunami aid was a unique opportunity to improve their housing situation. However, improving the housing situation of some people by violating the properties of others does cannot be considered an acceptable solution. We found that many owners of vernacular houses were profoundly attached to their house but the social pressure to give them up was tremendous and particularly elderly people and widows were unable to protect their property rights.

ii) Depletion of natural habitat

Coastal villages in Tamil Nadu are traditionally immersed in a thick vegetation of a large variety of bushes and trees. This shade-providing vegetation protects people from the scorching heat and is of vital importance in a very hot climate. Trees further supply local communities with important livelihood resources such as fuel, fruits, vegetables and fodder. The importance to pay attention to the natural habitat during reconstruction had been underlined by international environmental organisations such as IUCN and the WWF (Maggannis and Elliot 2005) but has not been recognized as

an issue at the local level. In several villages the contractors employed by NGOs for housing reconstruction refused to start any reconstruction work before the ground was completely cleared from pre-tsunami houses, trees and other vegetation. In one village people estimated that 800-1200 trees had been cut down to build the new village. In one village were people had already moved to their new houses women told how dramatically their life has changed: leisure time can no longer be spent together under the shade of the trees, and children can no longer play outside because of the heat. Many people considered the cutting of trees one of the worse consequences of contractor-driven reconstruction. The missing trees may have severe consequences on coastal communities' livelihoods, social life and health situation.

Traditional houses with tiled roofs

iii) Socio-culturally inadequate houses

Fishing communities in Tamil Nadu have a strong housing culture that reflects their specific way of life and religious beliefs. Much importance is given to the veranda where people eat, rest and receive their guests during daytime and sleep in the night (Duyne 2006b). The new houses were conceived for nuclear families to which all married couples were entitled. This has led to a disproportional increase in marriages with boys and girls as young as fifteen who are getting married in order to obtain a house. This led to a break up of extended families, which may deprive the most vulnerable people, such as elderly people and widows from social protection. In fact, the possession of the house, which is passed through inheritance to the youngest son in exchange of support and care for his aging parents has close links to the informal social security systems. The assumption that fishers live in independent nuclear families is also reflected in the design of the proposed houses, which have a standard size of less than 30 m^2 divided in 3-4 rooms. In general they have no veranda or only a very small one. None of the rooms is sufficiently large to allow an average family to stay together in one place. Whereas some young people may be looking forward to escape from the control of their parents, elderly people and widows were worried, as they feared that once the family split, their children would no longer care for them.

iv) Poor construction quality

Even though the casualties following the tsunami cannot be attributed to the vulnerability of the built environment, the government put major emphasis on promoting multi-hazard resistant houses. However, whether the new houses will be safer and more durable than vernacular houses depends on the quality of construction. Defects in construction may lead to problems that cannot be solved by the people through repair and maintenance. Based on these considerations we

critically reviewed the quality of ongoing reconstruction works in a sample of villages. The quality of construction was generally poor, which will inevitably lead to a rapid deterioration of the buildings. Poor quality was caused by poor labour skills, poor quality of materials, housing design features that do not match with local building capacity, lack of quality control and supervision, and vested interests. In many cases the consequences of poor construction quality were irreversible and cannot be mitigated by repairs and improvements by the owners.

v) Social conflicts

There is evidence that post-tsunami reconstruction is led to a number of social problems, such as anomy and social disarticulation. Conflicts of interests between those taking advantage of the reconstruction and those negatively affected split communities that before the tsunami were living in relative harmony. In particular the confiscation of private land and the forced demolition of undamaged houses has led in some villages to overt violence. In one village the conflicts between those in favour and those against demolition escalated to a point where the police had to intervene and remained stationed in the village for over three weeks. Most male escaped from the village out of fear of being arrested and fishing activities were disrupted.

vi) Exclusion of the most vulnerable people

As was mentioned above, the government policy did not allow reconstruction within 200 m from the sea. In many villages this implied that approximately 30-40% of the households needed new land for relocation. As was mentioned above, the difficulties to find land for relocation led some villages to solve the problem by confiscating the land and demolishing the houses of non-affected people. But not all NGOs and village leaders followed this approach. Other villages and NGOs faced this constraint by building houses for whoever owned land. These were generally not those rendered homeless by the tsunami. For example, in one villages, where approximately 60 households were displaced and living in temporary shelters, the NGO started to build houses for all those who could prove ownership of a sufficiently big plot to build a house. In this way they managed to build 38 houses. The next step was to demolish 110 undamaged houses that had been built a few years earlier by the Fishery Department and that had already been upgraded by another NGO. Two years after the tsunami the NGO completed the construction of almost 150 houses. But the housing problem of those households who were really affected by the tsunami had still to be addressed.

Systematically excluded from housing assistance were also widows and old aged people. This problem was related to the fact that the allocation and distribution of houses was left to the community leaders who developed their own eligibility criteria. These criteria did not include whether a person was made homeless by the tsunami, but whether he or she was married. Old aged people were expected to live with their children even if the new houses had no space for extended families. There were no solutions for old aged people with no children living in village. One village leader explicitly told us that it was not worth giving houses to widows because anyhow they would soon die.

Post-tsunami houses in Tamil Nadu

Discussion and conclusions

The ongoing debate among experts and international humanitarian agencies on whether owner-driven post-disaster housing reconstruction constitutes a viable alternative to agency-driven reconstruction is often insufficiently grounded on empirical research and rarely reflects upon the concerned citizens' perspectives. Our research in Gujarat and Tamil Nadu aimed at filling this gap. It was found that in both contexts there was a strong housing culture and building capacity. In Gujarat, the State Government and many local NGOs recognised and built upon this capacity, by supporting owner-driven reconstruction. Financial assistance for reconstruction was embedded in a housing reconstruction programme that included technical support, quality control and the establishment of decentralised subsidized construction material banks. The outcome of its large-scale housing reconstruction programme was successful, proving that owner-driven reconstruction is potentially more cost- and time-effective and constitutes a socio-technically viable alternative to agency-driven reconstruction.

Unfortunately Gujarat's experience did not influence reconstruction practices in Tamil Nadu; prejudices against fishing communities, the availability of unprecedented private donations, an insufficient number of committed local NGOs led to culturally and environmentally insensitive contractor-driven reconstruction, but to the systematic demolition of undamaged vernacular houses, and to cutting down thousands of trees to make space for new houses. This shows that a number of factors inherent to contractor-driven reconstruction may not only fail to meet the target group's housing needs but also reduce people's resilience and wellbeing.

There is an urgent need for government policies, international humanitarian agencies and NGOs to be culturally and environmentally more sensitive and to reconsider their post-disaster housing reconstruction approaches. Likewise it is time for funding agencies to realise that post-disaster housing reconstruction is more than building multi-hazard resistant houses and that contractors may not be the most qualified actors to come forward with environmentally sustainable, socially equitable and culturally sensitive solutions.

References

Abhiyan. 2003. Coming Together. Vol V. Bhuj: UNDP/Abhiyan.

Asian Development Bank, UNDP and the World Bank. 2005. India Post-Tsunami Recovery Program. Preliminary Damage and Need Assessment. Available at: http://www.adb.org/Documents/Reports/Tsunami/india-assessment-full-report.pdf

Baldauf, S. 2001. "Aftermath: India Rises from Rubble with Old Social Divides" URL:http://www.reliefweb.int.

Barakat, Sultan. 2003. *Housing Reconstruction after Conflict and Disaster*. Oversee Development Institute HPN Network Paper No. 43, London.

Boen, T. and R. Jigyasu. 2005. Cultural Considerations for Post-disaster Reconstruction. Post-Tsunami challenges.
Available at: http://www.adpc.net/infores/newsletter/2005/4-6/TBindo1.pdf

Davidson, C. et al. 2007. Truths and myths about community participation in post-disaster housing projects. *Habitat International*, Vol 31, 100-115.

Davis, I. 1981. *Disasters and the Small Dwelling*. Pergamon Press, Oxford.

----------. 1997. Disasters. In *Encyclopedia of Vernacular Architecture of the World, Vol. 1: Theories and Principles,* ed. P. Oliver, Oxford University Press, Oxford.

Downing, T. E. 1996. 'Mitigating social impoverishment when people are involuntarily displaced' In *Understanding impoverishment*, ed. C. McDowell, Bergham Books, Oxford

Duyne Barenstein, J. 2006a. *Housing reconstruction in post-earthquake Gujarat. A comparative analysis*. Oversee Development Institute, HPN Network Paper No. 54, London.

----------. 2006b. 'Challenges and Risks in Post-tsunami Housing Reconstruction in Tamil Nadu', *HPN Humanitarian Exchange,* Vol 33, pp. 38-39.

Duyne Barenstein, J. and D. Pittet. 2007. 'Post-disaster housing reconstruction. Current trends and sustainable alternatives for tsunami-affected communities in coastal Tamil Nadu', *Point Sud,* Vol 8, pp 5-8.

Enarson, E. 2001a. "We Want to Work": Rural Women in the Gujarat Drought and Earthquake. Ahmedabad: Disaster Management Institute. URL: http://www.colorado.edu/hazards/qr/qr135/qr135.html

Government of Tamil Nadu (GOTN) / Government of Pondicherry (GOP). 2005. India Emergency Tsunami Reconstruction Project.
Available at: http://www.tn.gov.in/tsunami/Tsunami_ESMF.pdf

Gujarat State Disaster Management Authority (GSDMA), 2002. Gujarat Earthquake reconstruction. GSDMA Press, Gandhinagar.

----------, 2005. Grit and Grace. The Story of Reconstruction. GSDMA Press, Gandhinagar.

Gujarat State Disaster Management Authority (GSDMA). 2002. Gujarat Emergency Earthquake Reconstruction Project. After 700 Days. Ahmedabad: GSDMA (available online: http://www.gsdma.org/pdf/700days.pdf).

Gupta, Smita. 2002. A rare Resilience. Quake-hit Gujarat bounces back. *The Times of India*, March 2002.

Jigyasu, R. 2001a. From 'Natural' to 'Cultural Disaster. Consequences of post-earthquake rehabilitation process on cultural heritage in Marathwada region, India. Paper presented at the International Conference on Seismic Performance of Traditional Buildings, Istanbul. URL: http://www.anglia.ac.uk/geography/radix/resources/jigyasu.doc.

----------. 2001b. From Marathwada to Gujarat. Emerging challenges in post-earthquake rehabilitation for sustainable eco-development in south Asia. URL: http://www.grif.umontreal.ca/pages/i-rec%20papers/rohit.PDF

----------. 2001c. Post-earthquake rehabilitation in Gujarat. Nine Months After. A Field Assessment. Trondheim: Norwegian University of Science and Technology

IFRC 2007. Owner-driven housing efforts continue in the north and east of Sri Lanka. Available at: http://www.reliefweb.int/rw/rwb.nsf/db900sid/MKOC762E38?OpenDocument

Mrotzek-Sampat. 1997. India, South. In *Encyclopedia of Vernacular Architecture of the World, Vol. I: Cultures and Habitats,* ed. P. Oliver, Oxford University Press, Oxford.

Oliver, P. 2003. *Dwellings. The Vernacular House World Wide*. Phaidon Press Limited, London

----------. 2006*. Built to Meet Needs. Cultural Issues in Vernacular Architecture*, Elsevier Architectural Press, Oxford.

Oliver-Smith, A. 1990. 'Post-disaster housing reconstruction and social inequality. A challenge to policy and practice', *Disasters,* Vol 14, pp 7-19.

Oliver-Smith, A. 1996. 'Anthropological Research on Hazards and Disasters'. *Annual Review of Anthropology,* Vol 25: 303-328.

TISS (Tata Institute of Social Sciences). 2005, The State and Civil Society in Disaster Response. An Analysis of the Tamil Nadu Tsunami Experience. Available at: http://www.un.org.in/untrs/reports/care2005rep.pdf

Twigg, J. 2006. Technology, Post-Disaster Housing Reconstruction and Livelihood Security. Available at: www.benfieldhrc.org/disaster_studies/working_papers/pdfs/workingpaper15.pdf

UN Habitat. 2007. Building back better in Pakistan. UN Habitat, Nairobi. Available at: http://www.unhabitat.org/downloads/docs/4627_75789_GC%2021%20Financing%20Field%20Report%20Pakistan.pdf

UNDP. 2001. From Relief to Recovery. The Gujarat Experience. Dehli: UNDP.

UNDP/Abhiyan. 2001. Coming Together: A Document on the Post-Earthquake Rehabilitation Efforts by Various Organizations Working in Kutch. Bhuj: UNDP/Abhiyan.

Vatsa, Krishna. 2001. Government Response. Report on the Gujarat Earthquake for the Engineering Research Institute. URL: www.eeri.org/Reconn/bhuj_India/Pgovtresp/html.

Wisner, B. 2001. Some Root Causes of Disaster Vulnerability in Gujarat. January 31, Report for the American Friends Services Committee. URL: http://www. reliefweb.int. URL:http://online.northumbria.ac.uk/geography_research/radix/resources/worldaid99.doc

The World Bank/Asian Development. 2001. Gujarat Earthquake Recovery Program. Assessment Report.Yagnik, Achyut. 2002. The Pathology of Gujarat. URL: http://www.india-seminar.com/2002.

Author's Biography

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Jennifer Duyne Barenstein (Jennifer.duyne@supsi.ch) has a PhD in social anthropology. She is a senior researcher and head of the World Habitat Research Unit of the Institute for Applied Sustainability of the Built Environment, University of Applied Science of Southern Switzerland (www.worldhabitat.supsi.ch). She has been involved in a number of interdisciplinary research projects and evaluations on post-disaster recovery and reconstruction in India, Indonesia, Sri Lanka, Bangladesh, Nicaragua and Argentina.