



# Winners and losers from the 2001 Gujarat earthquake

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1. This paper is the result of a field trip undertaken by staff and students from CENDEP in January 2007, who were joined by staff from the NGOs: SEEDS India; AIDMI; CARE India; Unnati; and Abhiyan.

**ABSTRACT** This paper<sup>(1)</sup> looks at some of the winners and losers in the reconstruction efforts following the 2001 earthquake in Gujarat. It reviews some of the consequences of different approaches to reconstruction and these are illustrated by the experiences of three villages. It ends with a discussion of the lessons that are repeatedly ignored after disaster.

**KEYWORDS** earthquake / Gujarat / livelihoods / risk / urban / vulnerability

## I. THE GUJARAT EARTHQUAKE

On 26 January 2001, India's worst earthquake in more than 50 years struck the western state of Gujarat. Between 16,000 and 20,000 people lost their lives, more than 1.2 million properties were damaged, including 15,000 schools, and 1.7 million people were left homeless. Kachchh was the worst affected area, with 75 per cent of the district destroyed. The cost of the damage was estimated at US\$ 3.4 billion.

The earthquake occurred on one of India's most important national holidays, Republic Day. Six years later, in Bhachau, one of the region's worst hit towns, the chief executive of the municipal council read out a list of reconstruction accomplishments at the Republic Day celebrations: nearly all of the buildings and infrastructure that were destroyed by the earthquake have been rebuilt; a new hospital has been built on the site of its predecessor; infrastructure has been restored within the town and the rubble has been cleared; and only a few damaged buildings remain.

Bhachau, close to the earthquakes' epicentre, suffered terrible damage; it was all but flattened. An estimated 5,000 persons were killed and 7,000 houses damaged. Yet a visit to Bhachau today shows the pace and quality of rebuilding to have been remarkable, and homes, offices and shops have been rebuilt on the sites of their previous incarnations. To this extent, Bhachau's reconstruction, on the site of the original Bhachau, has been remarkable.

## II. THE RECONSTRUCTION EFFORT

The national and global response to the earthquake was huge and resulted in a large amount of financial and technical support being provided by

the government of India and the Indian army, as well as Indian civil society, the global Gujarati diaspora, NGOs and others, including the private sector and state governments from elsewhere in India.

The rehabilitation package was worked out in detail and was well managed. The Gujarat State Disaster Management Authority (GSDMA), established to manage the affairs of earthquake rehabilitation, went on to be awarded the 2003 UN Sasakawa Award by the United Nations International Strategy for Disaster Reduction, in recognition of the earthquake rehabilitation work. The salient feature of the work undertaken by the GSDMA was to bring together the responding agencies, including NGOs, under one system that defined rehabilitation packages.

In addition to the 490 towns that were affected, including Bhachau, some 8,000 villages were damaged or destroyed. To provide a coordinated response between the large number of groups offering assistance, the government of India put in place a system of village adoption, whereby NGOs and other entities took on responsibility for the reconstruction of the villages. Subsequently, most households were offered one of two choices:

- *owner-driven reconstruction*, wherein households receive the grant to rebuild their homes, conditional on passing inspections to check the quality of building. Owner-driven housing for the most part took place on the cleared sites of buildings that had collapsed; or
- *donor-driven reconstruction*, wherein an NGO or other entity builds the house. Donor-driven programmes formed the basis of larger shelter reconstruction projects of villages in new locations. Smaller, donor-driven projects also took place within rebuilt villages on the sites of collapsed and/or damaged houses.

The government compensation package to affected households comprised a grant of up to 90,000 Rupees (about UK£ 1,100) to rebuild their homes. The outpouring of support for Gujarat also meant that many groups from civil society, state government and established NGOs raised funds to rebuild individual buildings (e.g., hospitals and community centres) and also villages, without accessing the government of India grants.

Many different combinations of these approaches took place within hundreds of villages across Gujarat. The following describes the results of reconstruction efforts in three Kachchh district villages, namely Adhoi, Vondh and Junawada.

Adhoi, a prosperous settlement of about 3,000 households made up largely of farmers and traders, had grown rapidly in the last 10 years. The earthquake killed 354 residents<sup>(2)</sup> and injured many more. The death toll included 25 school children marching for Republic Day and all those present in a temple.

After the earthquake, Adhoi village was adopted by the government of Maharashtra, which, through the Gujarat Earthquake Rehabilitation Project (GERP), offered to rebuild a new Adhoi at a location some three kilometres from the original village, which was all but abandoned. GERP offered to provide houses free of charge. Of the 3,000 original households, 2,000 accepted the government of Maharashtra's package, with the remaining villagers choosing to live elsewhere. Land was acquired through landowner donations and formal land acquisition, and additional support was provided by NGOs such as Lions International and Rotary International.

2. *Deccan Herald* (2003), "Lending a helping hand", 6 July.

## THE 2001 GUJARAT EARTHQUAKE

The building of the new Adhoi was put out to tender by GERP and was won by a consulting engineering company. Housing design was provided by an NGO, Unique Service Trust, Latur, and this was approved by the Indian Institute of Technology (IIT).

The town was laid out according to a grid design, with a wide central spine road and zoned areas for housing and non-residential use. Two thousand houses were built, almost all of them known as Type III housing, measuring 540 square feet and comprising one bedroom, a kitchen, a veranda and a toilet.

At present, residents from the old Adhoi inhabit the new Adhoi. However, the same cannot be said for the nearby village of Vondh, which is located some 96 kilometres from the earthquake's epicentre. Like Adhoi, it suffered almost total building collapse and an estimated 400 of the village's population of 9,000 died.<sup>(3)</sup> Vondh was also adopted by the government of Maharashtra and rebuilding was overseen by GERP, and 847 "units" were built. In addition, the NGO Christian Aid donated UK£ 772,000 for house building and rehabilitation.

About half the village's 1,700 households accepted the government of Maharashtra's offer and, subsequently, new houses were built some three kilometres from the old Vondh; the other half of the village elected to rebuild their homes in the old Vondh.

Visiting the new Vondh today is an odd experience. From a distance, the new settlement looks much the same as the new Adhoi, with a similar grid design layout of a central spine road and row housing. Yet on arrival, it quickly becomes clear that the new Vondh is deserted; the houses are all locked up and some have cattle feed and fodder inside. There are, however, one or two houses that are lived in, although the inhabitants are not from Vondh but are migrant workers who rent the properties.

Where then are the residents of Vondh? The answer is apparent when visiting the old Vondh, where nearly all the residents now live. While only half of the old Vondh's residents had elected initially to go for "owner-driven" housing, the other half had followed suit subsequently.

3. Christian Aid (2002), "Gujarat a year on – a tale of hope amid devastation", news release, 17 January.



**PHOTOS 1A AND 1B**  
Old Adhoi, abandoned after the earthquake (left);  
new Adhoi, rebuilt three kilometres away (right)  
© David Sanderson



**PHOTOS 2A AND 2B**  
**New Vondh (left); "new old" Vondh (right)**  
 © David Sanderson

When asked why the new Vondh lies empty, residents supplied a range of answers. One stated that the reconstruction had taken too long; another said that the old Vondh "...is the place of his ancestors". In fact, the rebuilding had been rapid: the new Vondh, like the new Adhoi, was completed in 2003 and handover ceremonies from GERP had taken place at the same time. One 2005 newspaper report, however, referred to "...a lack of initiative on the part of the authorities to persuade the residents to occupy the houses" as the reason for the empty new Vondh.<sup>(4)</sup>

Junawada, located on the edge of Bhachau, is perhaps the poorest of the three villages and was also all but destroyed by the earthquake. Again, its experience was different to those of Adhoi and Vondh. Junawada did not have formal government-recognized tenure despite its existence for more than 200 years and, as a result of this non-formal status, the Bhachau authorities sought to relocate the village after the earthquake. Village residents, however, resisted this. They were supported by the NGO Unnati, which campaigned for Junawada's inclusion within the Bhachau municipal plan, and were aided also by a World Bank loan condition that villages should not be forcibly relocated.

Today, the rebuilt Junawada is a mixture of housing types, including both owner- and donor-driven housing (depending on which approach residents chose), retrofit housing (the few houses left standing that were strengthened after the earthquake) and timber "interim" emergency housing, which was built straight after the earthquake.

Since it is now part of Bhachau's municipal plan, the village is also benefiting from infrastructure provision, including the building of a water-borne sewerage system.

### III. DISCUSSION

Six years on, the usage of these villages is a measure of the effectiveness of different reconstruction efforts. While the new Vondh is empty, the original village of Vondh is lived in and, moreover, retains its "sense of

4. *Deccan Herald* (2005), "Rebuilding a beautiful new world", 30 January.



**PHOTO 3**  
**Housing in Junawada: interim housing in the foreground and a mixture of donor-driven and owner-driven housing behind**  
 © David Sanderson

place”, i.e., the spirit that makes it Vondh. The same is true of Junawada. The new Adhoi however has none of the spirit of the original Adhoi. When asked their views on the new Adhoi, residents’ responses were wholly negative: *“It is dead”*; *“We are bored”*; *“There are no shops.”* This may change as the new Adhoi becomes established, and there are signs of this happening as a few houses are modified or painted by their owners. Yet it may not be unfair to suggest that the new Adhoi residents’ ability to settle in to their new environment has been hampered by its design, a situation that might have been avoided had there been more engagement by the residents themselves in design and layout decisions.

While the village was almost completely destroyed by the earthquake, in the end Vondh’s residents rebuilt their village themselves, despite the construction of the new Vondh less than three kilometres away. The villagers did not, and for now still do not, want to live in the new township, despite owning the properties. They say that they did not want to leave their village, *“...it is the home of our ancestors.”* When asked who built the village, the proud response is that they did it themselves. They say that building the new Vondh took too long – although it was finished within 18 months.

Junawada’s experience is on a smaller scale, slower and less dramatic. However, without large-scale, external investment, Junawada has been able to maintain its character. With a combination of both owner- and donor-driven rebuilding, the scale and pace of reconstruction has been at a rate that Junawada’s residents can engage with. Crucially, most villagers rebuilt their houses on the original sites or next to where they had collapsed.

The irony here is that what may arguably turn out to be one of the most effective reconstruction efforts was the one most threatened by its "illegal" status.

In Junawada, the variety of housing types used and rebuilding on the original village plots has resulted in it retaining its village-like qualities, in contrast to the many monotonous and uniform large-scale, donor-driven villages that have no bearing on what stood before the earthquake. In Junawada, an earthquake-resistance aesthetic has emerged in the new houses, with the plinth, middle and top ring beams painted in different colours or given prominence in other ways. This both commemorates the earthquake and provides a useful educational tool concerning the principles of post-earthquake reconstruction.

#### IV. LEARNING LESSONS?

The experiences of Adhoi, Vondh and Junawada are far from unusual in the story of post-disaster reconstruction. In fact, the dangers of mass housing have been recorded for more than 30 years<sup>(5)</sup> and, in recent years, have been evident in India: in Latur in 1993; after the 1999 earthquake in Chamoli, Uttarakhand; after the 1999 super cyclone in Orissa; and after the 1977 cyclone in Andhra Pradesh. Today, the same mistakes are being repeated in the tsunami-affected communities of South Asia.<sup>(6)</sup> The following are some of the lessons that have emerged.

**The drive for quick reconstruction can lead to inappropriate and costly responses.** Often, building takes place quickly at the expense of meaningful participation. Research undertaken by Tony Beck<sup>(7)</sup> for ALNAP and the ProVention Consortium after the 2005 South Asia earthquake found that "...there is accumulated evidence that people affected by disasters want to participate fully in the response, even if this means a slower implementation process." Donors themselves may also drive rapid reconstruction. The same research noted that "...disbursement pressure – the need to get money out of the door – has ... partly determined response mechanisms." Citing the Disaster Emergency Committee (DEC) evaluation of its members' responses, it noted that "...managers on the ground began to see their task as spending money within the (DEC-imposed) timescale rather than planning good programmes."

In Gujarat, the consequence of these concerns was to prioritize speed over ownership. GERP's motivation<sup>(8)</sup> was stated as follows: "*It is our keen interest and endeavour to complete the (reconstruction) project at the earliest.*" To these ends, participation was relegated to some of the most basic of decisions, for example whether to opt for donor- or owner-driven replacement of housing. GERP claims, however, to have consulted with local people, but primarily with officials: "*We have been in continuous contact and interaction with GSDMA officers, local revenue officers, all other concerned officers, concerned non-officials and concerned villagers at large.*"

**Contractor-driver construction projects are rarely developmental initiatives.** The drive to rebuild quickly inevitably leads early on to the decision to hire commercial contractors. At this point, projects such as these usually cease to be developmental initiatives and become construction projects. The participation of residents is relegated to mixing concrete or making building blocks, or worse. On a visit to one village in Kachchh district in 2002, the authors witnessed an NGO reconstruction

5. Ian Davis has written about the poor decisions made in post-disaster reconstruction. See Davis, Ian (1978), *Shelter after Disaster*, Oxford Polytechnic, Oxford, UK.

6. For a discussion of donor-driven versus owner-driven housing in Sri Lanka, see for example, Lyons, M and S Amarasingh (2006), "Building back better: from aspiration to reality", Housing Advocacy Report for Practical Action, South Asia Office; also Lyons, M (2007), "Building back better – large-scale impacts of small-scale approaches to reconstruction", IDEAR Working Paper Series 2007/1, London South Bank University.

7. Beck, T (2005), "South Asia earthquake 2005; learning from previous earthquake relief operations", ALNAP and ProVention Consortium, accessible at [www.proventionconsortium.org](http://www.proventionconsortium.org), page 10.

8. Government of Maharashtra (2003), "Gujarat earthquake rehabilitation project", accessible at <http://mdmu.maharashtra.gov.in/pdf/gerp/gerpreport.pdf>.

programme where women had been trained to make blocks to sell to the contractors who were building their homes. The contractors, however, would not buy the blocks, stating they were sub-standard, and instead used their own which they were making on site. Both the building and the block-making programmes were under the control of the same NGO. The women were forced to sit by the roadside with their mountains of blocks trying to sell them.

Sadly, this is not an isolated incident. Women's self-help groups have been formed in almost every village where NGOs have extended rehabilitation aid. Most of these women have been trained in some vocational skill or other, including tailoring, embroidery, handicrafts and food processing. Most training has involved short-term crash courses. In many cases, there has been no sustained skills improvement, no introduction of a management system and, most importantly, no market linkage. Most groups have failed to benefit from the training provided. There have been very few initiatives addressing the livelihood issue for men, whose earning capacity has been hit by repeated disasters<sup>(9)</sup> in an already inhospitable terrain. Many men can be seen sitting idle, willing to spend endless time talking in groups at any time of the day.

Fundamentally, the contractor-driven approach to shelter is focused on the construction of housing units. Yet shelter is far more than that. In 1976, John Turner<sup>(10)</sup> described housing as a verb, noting that what is important is what a shelter does for a family socially and economically, as well as physically in keeping them dry and warm. In 2002, Hernando De Soto<sup>(11)</sup> discussed at length the importance of land and shelter as an asset that can be capitalized to improve livelihoods. In 1978, Ian Davis<sup>(12)</sup> described housing as a process, not just an object. More recently, Kennedy et al. stated that: "*The first point is that there are clear advantages in approaching settlement and shelter as processes involving the people who will use them, rather than as objects or products to be built, turned over to the recipients and left behind.*" They note that: "*Thirty years after Ian Davis originally espoused this notion, it is rarely implemented in the field.*"<sup>(13)</sup>

**Inappropriate layout and shelter design.** In Gujarat, many large-scale, donor-driven projects were costly, inappropriate, increased risk, and were mean in design terms. Rebuilt villages appear to have been designed primarily to suit the demands of mass house building with no consideration of Gujarati culture. In an observation concerning temporary shelter that turned out to be descriptive of many reconstruction efforts, the NGO Oxfam stated one month after the earthquake that: "*The temporary tents that have come up in Adhoi spell disaster. They are a fire risk, lack sanitation facilities and were built without people's involvement. This top-down approach must be stopped.*"<sup>(14)</sup>

Within both Vondh and Adhoi a standard "unit" design has been used for housing. The houses bear little relation to Gujarati cultural precedents in either layout or appearance. Although the minimum standards of space and infrastructure have been met, the less tangible dimensions of planning quality, people's aspirations, livelihood linkages and emotional and perceptual values are missing.

Several programmes elsewhere employed shelter designs comprising a small concrete cube with a heavy flat concrete roof. These houses were found to be more than five degrees Celsius hotter than traditional houses during the hot desert summers, when temperatures soar close to 50 degrees. Whereas the traditional houses used thermally friendly local materials

9. Gujarat experienced floods in 1997, an outbreak of malaria in 1997, a cyclone in 1998, drought during 1999–2001, an earthquake in 2001 and communal riots in 2002.

10. Turner, John (1976), *Housing by People; Towards Autonomy in Building Environments*, Pantheon Books, New York.

11. De Soto, Hernando (2001), *The Mystery of Capital. Why Capitalism Triumphs in the West and Fails Everywhere Else*, Black Swan, London.

12. See reference 5.

13. Kennedy, J, J Ashmore, E Babister and I Kelman (2007), "Post-tsunami transitional settlement and shelter: field experience from Aceh and Sri Lanka", *Humanitarian Exchange* No 37, March, page 28.

14. Oxfam India (2001), "Gujarat earthquake: healing the wounds", February 2001.

and had sloping tiled roofs that were always partially shaded and could “breathe”, the flat-roofed concrete houses became ovens during the summer months. The inflexible, tiny and cramped layouts bore no resemblance to the living patterns of many Gujaratis. The open spaces around the houses, used for keeping livestock and for the daily chores of women, were lost in the new row housing schemes that squeezed two to four families into a single constructed block that accommodated one family per room.

One explanation for ignoring traditional norms might lie in the dominance of the disaster in the psyche of the shelter designers. Shelters have been built with this foremost in mind, relegating other needs way down or even off the list. Hence, while these shelters might withstand the strongest earthquake, they are quite unbearable to live in!

**The unhelpful perception of a victim/saviour relationship.** After an earthquake, the response is to help the victims. At what point, however, do people stop being victims? For many post-disaster recovery programmes, the label seems to stick. The housing responses were classed as donor-driven and owner-driven, as if there was a difference in the eventual ownership. Villages were “adopted” by outside organizations, adoption being a process of taking on the guardianship of the less empowered.

Such a perception continued until the final moment when, as stated in the GERP final report in 2003, the townships of Vondh and Adhoi, built by the government of Maharashtra, were “handed over”: *“The government of Maharashtra has successfully completed the Rehabilitation Earthquake project for affected families in both the villages...The project handed over...to the people of Adhoi and Vondh villages.”*<sup>(15)</sup>

**Donor-driven programming can neglect social capital.** Beck notes that: “The role of external agencies ... becomes one of supporting indigenous capacity and working with communities to support their efforts

15. See reference 8.



**PHOTO 4**  
**Donor-driven housing scheme, Gujarat, 2002**  
 © David Sanderson



16. See reference 7, page 4.

and build their capacities. At the very least, interventions should not undermine local capacity."<sup>(16)</sup>

When powerful external agents are driving the process within an affected village, the social capital present within long-standing communities can be ignored or even damaged. "Victims" may be assumed not to have lost all assets, and while this might be the case for such tangibles as property and belongings, it may well not be the case for intangible assets of networks and relationships. Indeed, these may have been strengthened by the disaster through mutual support in the aftermath. In Adhoi, while there was clearly a large amount of external support provided, there seems to have been little effort to tap what residents themselves might have been able to contribute.

As seen in Vondh, ignoring social capital has expensive consequences. This is not unusual. Research undertaken by Camillo Boano<sup>(17)</sup> into post-tsunami reconstruction in Sri Lanka describes 100 shelters built by an NGO along with a construction company, which, eight months after completion, lay empty; these were described by local people as the "empty box" houses. Boano documents many problems, including an allocation process that ignored those being housed: "*Owners did not participate in the construction process, and the fact that they did not know which house was theirs until building was finished meant that house owners could not monitor progress informally.*" Partly as a result of this, Boano concludes, "*...the quality of houses was quite insufficient.*"

17. Boano, C (2007), "Dynamics of linking reconstruction and development in housing and settlements for forced migrants in post-disaster situations", PhD Dissertation, Oxford Brookes University, page 295.

## V. CONCLUSION

Post-disaster reconstruction programmes are easy to get wrong. They can lead to a huge waste of resources and can increase vulnerability by causing greater damage to the long-term physical and sociocultural environment than they give benefit in terms of infrastructure and economy in the short term. They can ignore livelihoods, existing capital, resources, human rights and opportunities for long-term disaster reduction. Reconstruction is not a fire-fighting job, and those who ought to be engaged in the process are no longer victims but, rather, equal partners. To these ends, reconstruction must be seen as a developmental process rather than a disaster response.

Too often, those tasked with making reconstruction decisions consider a house as a shelter or, worse still, a "unit". Yet, as noted by Davis, housing is a process. The physical object itself, the building, is only that part of the iceberg that is above water. The parts beneath – the livelihood opportunities, cultural values and aspirations – are the unseen, yet most important, aspects of successful housing.

Only residents themselves are able to supply this knowledge. As Kennedy et al. conclude from their experience of reconstruction after the Asian tsunami:

"Community participation in decision making for settlement and shelter should involve representative ages, genders and ethnicities, drawn from the people who will live in the settlement and from others who will be affected. Community participation should be used to exchange accurate and realistic information, including on the resources available and the timeframe required to provide transitional and permanent settlement and shelter."<sup>(18)</sup>

18. See reference 13, page 31.

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