

Network Paper

In brief

- Besides human casualties, one of the most visible and striking effects of any major disaster is the destruction of houses. Loss of housing destroys livelihoods, protection and privacy. Effective housing reconstruction is essential to restore affected communities' dignity, society, economy and cultural identity.

- Many humanitarian organisations assume that the quickest and most effective way to rebuild houses after a disaster is to employ professional construction companies. At the same time, however, there is growing awareness of the limitations and risks of the contractor-led approach. These difficulties are encouraging other, more participatory strategies.

- This paper aims to contribute to this discussion through an exploration of local perceptions of housing reconstruction in the aftermath of the earthquake that hit Gujarat in India on 26 January 2001. Through comparative analysis, it explores five different approaches: the owner-driven approach; the subsidiary housing approach; the participatory housing approach; the contractor-driven approach *in situ*; and the contractor-driven approach *ex nihilo*.

- While this paper covers Gujarat specifically, its findings will be relevant for agencies engaged in post-disaster housing reconstruction in other contexts, for instance in areas hit by the Indian Ocean tsunami and in post-earthquake Kashmir.

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Housing reconstruction in post-earthquake Gujarat

A comparative analysis

Commissioned and published by the Humanitarian Practice Network at ODI

Jennifer Duyne Barenstein



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think-tank on international development
and humanitarian issues

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100 Indian Rupees (Rs) = UK£1.20 = US\$2.30 (January 2005)

Chapter 1

Introduction

The dwelling is more than the materials from which it is made, the labour that has gone into its construction, or the time and money that may have been expended on it; the dwelling is the theatre of our lives, where the major drama of birth and death, of procreation and recreation, of labour and of being in labour are played out and in which a succession of scenes of daily lives is perpetually enacted.¹

Besides human casualties, one of the most visible and striking effects of any major disaster is the destruction of houses. Loss of housing destroys livelihoods, protection and privacy. Effective housing reconstruction is essential to restore affected communities' dignity, society, economy and cultural identity.

Humanitarian agencies engaging in post-disaster housing reconstruction confront a number of key questions. Should they provide temporary, semi-permanent or permanent housing? Should they offer financial, material and/or technical support? Should they bring in ready-made shelters, or should they involve disaster-affected people in construction? What housing technologies should be promoted or adopted? Should new materials and building techniques be introduced, or should projects build upon locally available knowledge and resources? Should agencies support self-help housing reconstruction, recruit local labour, encourage homeowners' participation or engage a professional construction company?

Ideally, these questions are answered according to a thorough contextual analysis, based on what is most appropriate in the specific economic, socio-cultural, technological, political and institutional context. In practice, however, approaches may also be determined by factors such as the agency's available resources, overall mandate, experience, capacity and preferences. As a result, within the same disaster context different agencies may adopt very different reconstruction approaches.

Many humanitarian organisations assume that the quickest and most effective way to rebuild houses after a disaster is to employ professional construction companies. At the same time, however, there is growing awareness of the limitations and risks of the contractor-led approach. Contractor-built reconstruction may lead to housing that does not respond to the cultural or social needs of disaster-affected communities. An emphasis on safety – increasing earthquake resilience, for instance – may see the introduction of modern technologies and construction materials that may be inappropriate to the local environment, and may make subsequent repairs and maintenance difficult or impossible.

These difficulties are encouraging other, more participatory strategies, whereby agencies retain a leading role in

reconstruction, but the community is also involved in the process. In particular, the so-called 'owner-driven' or 'cash-based' model is attracting increasing attention, including from leading international agencies like the World Bank. In this approach, people reconstruct their houses themselves; the role of external agencies is limited to the provision of financial and technical assistance. Owner-driven reconstruction has a number of advantages over contractor-led approaches: it is more cost-effective, building may be incremental, allowing occupancy before the house is fully finished, and occupancy rates tend to be significantly higher.

There is a growing body of literature concerned with the advantages and risks of different approaches to post-disaster housing reconstruction.² This paper aims to contribute to this discussion through an exploration of local perceptions of housing reconstruction in the aftermath of the earthquake that hit Gujarat in India on 26 January 2001. The earthquake was India's most severe natural disaster for almost 300 years. At least 20,000 people were killed and over 167,000 severely injured. An estimated 344,000 houses were destroyed, and over a million damaged. More than 7,600 villages and towns were damaged, and over 300 villages flattened; hospitals, health centres, schools and water and irrigation systems collapsed. Although 21 of Gujarat's 25 districts sustained some level of damage, over 90% of deaths and an estimated 85% of assets lost were in Kachch, the state's largest, and also one of its poorest, districts.

Gujarat was selected for three main reasons. First, in terms of the number of damaged houses and the area affected, the earthquake constituted an extremely severe and widespread disaster. Second, it marked the first time that owner-driven approaches to housing reconstruction were implemented on a truly large scale, with the government of Gujarat supporting the own-build reconstruction or repair of over a million homes. Third, the presence of a large number of national and international non-governmental agencies and private corporations, and the application of a range of approaches, from the contractor-driven reconstruction of entire villages to targeted material assistance to specific communities, provided an opportunity for a comparative analysis of the merits and drawbacks of different techniques and strategies.

While this paper covers Gujarat specifically, its findings will be relevant for agencies engaged in post-disaster housing reconstruction in other contexts, for instance in areas affected by the Indian Ocean tsunami and in post-earthquake Kashmir.

Reconstruction approaches

The bulk of the reconstruction work after the earthquake was carried out by the Gujarat government under the Gujarat

Emergency Earthquake Reconstruction Project (GEERP). The government also invited national and international governmental, non-governmental and private sector organisations to take part in the reconstruction effort by ‘adopting’ affected villages under a public–private partnership arrangement. In all, 75 agencies took over the full reconstruction of 272 villages, most of them in Kachch. Other NGOs offered reconstruction assistance without formally adopting a full village, or provided full housing to specific target groups.

The chapters that follow discuss five different housing reconstruction approaches employed in Gujarat.

- *The owner-driven approach.* The owner-driven approach enables communities to undertake building work themselves, with external financial, material and technical assistance. Owner-driven reconstruction does not necessarily imply that owners build the house on their own, but that, within given building codes, they retain full control over the housing reconstruction process. This approach was used by the government of Gujarat within the framework of the GEERP. Under the GEERP, almost 200,000 houses – some 87% of destroyed homes – were rebuilt by their owners, with financial and technical assistance from the government.
- *The subsidiary housing approach.* Under the subsidiary housing approach, agencies do not engage directly in housing reconstruction. Instead, they adopt a facilitatory role, providing additional material and technical help within the framework of government assistance. This paper focuses on the work of one local NGO offering housing assistance in seven villages in Rapar Taluka in Kachch district. The paper refers to this NGO as ‘SHA’.*
- *The participatory housing approach.* Under this approach, agencies assume a leading role in housing reconstruction, while involving home-owners in the planning, design and reconstruction of the house. This paper focuses on the participatory housing programme implemented by an important Gujarati NGO, referred to here as ‘PHA’. PHA identified 30 villages for reconstruction, totalling some 3,000 houses.
- *The contractor-driven approach in situ.* This approach involves tasking a professional building contractor to design and build the houses. By *in situ*, we mean that houses are rebuilt on the same sites occupied before the disaster. Typically, designs, materials and expertise are imported from outside the target community. The case study of the *in situ* approach described in this paper focuses on a large national NGO, which we call ‘CODIS’. With international funding or in partnership with international NGOs, CODIS rebuilt 11 villages, totalling around 3,000 houses.

*Since the aim of this project was not to evaluate the performance of specific agencies, agencies’ real names are not given.



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Participatory mapping

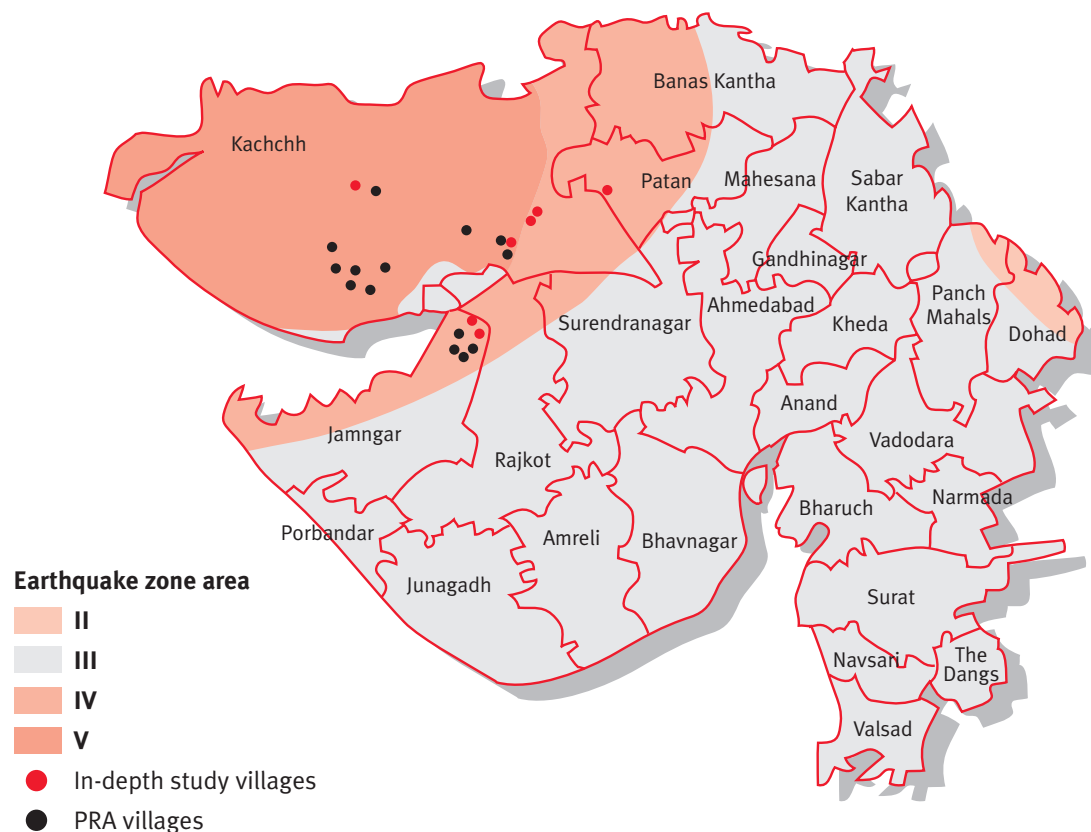
- *The contractor-driven approach ex nihilo.* As above, this approach uses professional building contractors. The difference between the *in situ* and *ex nihilo* approaches is that, in the latter, the entire village is rebuilt on a new site. The approach was adopted by a large national NGO, which this paper refers to as ‘CODEN’. With international funding or in partnership with international NGOs, CODEN rebuilt 11 villages, totalling 2,250 houses, plus communal infrastructure.

The implications of the comparative analysis of these five approaches for humanitarian agencies concerned with post-disaster housing reconstruction are outlined in Chapter 7.

This paper focuses on the provision of permanent housing after the earthquake, and so does not discuss semi-permanent shelters. Semi-permanent housing constituted an important part of the housing response after the disaster (in the first year after the earthquake, some 65,000 semi-permanent shelters were built in around 750 villages). However, the reconstruction approach used is not comparable with housing assistance projects design to replace or repair permanent structures, and so is excluded from the analysis.

Research methodology

The information on which this paper is based was gathered through in-depth research in eight villages, and Participatory Rural Appraisals (PRAs) in another 13. Twelve villages were in Kachch district, two in Patan district and seven in Jamnagar district. All the research sites were rural, which means that the study’s findings may not necessarily be applicable to urban areas. Village names are not given. The project was financed by the Swiss Agency for Development Cooperation and Swiss Solidarity, and the research looked at housing reconstruction projects implemented with Swiss Solidarity funding.

Figure 1**Map of Gujarat by earthquake zones**

The research was undertaken in two phases between October 2004 and March 2005, by which time the bulk of the reconstruction work had been completed. Phase 1 sought to capture individual and collective views about the impact of the earthquake via semi-structured interviews with key informants and stratified samples of men and women, focus groups, village walk-throughs, observation, participatory mapping of village and community infrastructures before and after the earthquake and the detailed participatory assessment of housing designs, construction materials and construction quality. Phase 2

involved a household survey in six villages, covering a random sample of 15% of households (totalling 434 face-to-face interviews). A research checklist and research questionnaire are in Annexes 1 and 2.

Whereas many project evaluations tend to give more space to agencies' experiences and perspectives, we deliberately focused on citizens' perspectives. Our aim was to find out how different categories of people articulated their views and experiences, and to avoid mediation or filtering of these views by project staff.

Chapter 2

The owner-driven approach

An extensive review of different post-disaster housing reconstruction approaches by Sultan Barakat points to a number of advantages associated with owner-driven approaches to housing reconstruction.³ The most tangible benefits are that the costs may be lower, building may be incremental, allowing occupancy before the house is fully finished, and occupancy rates tend to be higher. There are also a number of intangible benefits. Encouraging the active participation of disaster-affected communities in the reconstruction of their homes may be a useful way of restoring a sense of pride and well-being in people who have been through a trauma. 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 own preferences and requirements, and may strengthen local building capacities. With adequate financial and technical assistance, self-built houses are likely to be more sustainable. People, if given an option, tend to choose building materials and techniques that are familiar to them. Accordingly, they may be in a better position to provide for future additions and repairs. Finally, an owner-driven approach may contribute to preserving the local architectural heritage and vernacular housing styles, features fundamental to a community's cultural identity. In particular, in relation to the devastating experience of a disaster, it is important to give people some sense of continuity.⁴

An owner-driven approach also entails some risks and drawbacks. It raises questions about the degree of assistance more vulnerable sections of the community should receive to enable them to engage in reconstruction. People may be too busy pursuing their livelihood activities to spare the time to participate in or supervise construction work. Safety may be a concern where traditional construction practices are held responsible for large numbers of collapsed buildings. These risks can be overcome through the introduction of building codes and adequate technical assistance.⁵

The government's owner-driven reconstruction programme

In the wake of the earthquake, the government of Gujarat constituted the Gujarat State Disaster Management Authority (GSDMA). The GSDMA's rehabilitation policy included relocating most affected villages; assistance for the *in situ* reconstruction of severely affected villages; help with repairs and reconstruction in less damaged areas; and assistance for the reconstruction of modern buildings in



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An owner-built house in Rapar Taluka (Kachch district)

urban areas.⁶ The government's relocation policy was based on the one followed by the government of Maharashtra after the earthquake there in 1993. However, whereas in Maharashtra there appeared to be a consensus around relocation, this was not the case in Gujarat, and it met with stiff public resistance. It also ran counter to the preference of the main funder, the World Bank, which whenever possible avoids financing reconstruction approaches based on relocation. The policy was abandoned, and the government instead adopted an 'owner-driven' reconstruction approach under the aegis of the GEERP. The GEERP, largely funded by the World Bank, included the provision of financial and technical assistance and subsidised construction materials to enable people to rebuild their homes themselves.

Almost three-quarters (72%) of villages took advantage of the GEERP and opted to reconstruct their own houses. Under the programme, over 197,000 houses, corresponding to approximately 87% of destroyed homes, were rebuilt by their owners. This made it the biggest housing reconstruction programme ever undertaken, both in terms of the number of houses and geographic area. The Gujarat experience was also the first time in history that owner-driven reconstruction was facilitated by a government through financial, material and technical assistance on such a large scale.⁷

Financial assistance to homeowners was based on housing type and size, and on the level of damage. Compensation for destroyed houses ranged from a minimum of Rs40,000 to a maximum of Rs90,000. Assistance in the case of damaged houses ranged from Rs3,000 to Rs30,000. In order to establish the amount of compensation due, the government undertook systematic damage assessment surveys, carried out by a team comprising a government engineer, an official

of the *Panchayat* (the local government) and a representative of a local NGO. Photographs were taken of each damaged house.

Financial assistance was disbursed in three instalments. The first, comprising 40% of the total, was paid at the preparatory stage, the second upon completion of the walls and the remaining 20% once the house was finished. The second and third instalments were only disbursed after verification and certification by government engineers. Civil engineers were placed in all villages to provide guidance and to supervise construction, and a massive training programme was implemented for masons and engineers, accompanied by information and education campaigns on hazard-resistant construction.

The main reconstruction materials were bricks, stones and wood, and many people managed to recycle material salvaged from their former homes. Most housing followed vernacular designs and spatial arrangements, although there was also room for some innovation, such as the introduction of flat roofing. Individuals were also able to adapt their homes to suit their livelihood activities, such as cottage industries, farming and animal husbandry.

Issues, achievements and constraints

Beneficiary satisfaction

Our household survey covered 136 households in five villages that opted for self-reconstruction with government assistance. The majority of people were happy with their new houses. This is shown in Table 1, which indicates that, on average, 94.5% of households were fully satisfied, and a large percentage could find no faults with their new homes (as shown in Table 2). Satisfaction was highest among those who obtained the minimum government compensation of Rs40,000 (given to those whose dwelling was classified as a ‘fully damaged hut’) because the value of the pre-earthquake house was usually below this amount, which meant that the compensation was sufficient to improve their housing situation over their pre-



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An owner-built house in Bhuj (Kachch district)

earthquake circumstances. Our findings with regard to overall satisfaction are consistent with those of another survey carried out in 59 villages.⁸ This revealed that 91.5% of owners of self-built houses were satisfied. Three-quarters of respondents said that they would choose owner reconstruction in the event of a future disaster.

Damage assessments and financial assistance

The majority of people were satisfied with the government’s damage assessment survey, and also with the financial support they received (albeit a second survey was required following many complaints about the initial one). We visited several poor and remote communities, but found no evidence of discrimination against minorities or socially disadvantaged groups, though some people mentioned that they had to pay some ‘speed money’ (under 5% of the total financial compensation) to ensure the timely release of funds.

One criticism that was raised regarding the government’s compensation scheme was that people received assistance based on what they had lost, rather than on what they needed. After the earthquake, there were lively debates

Table 1: Satisfaction with owner-driven reconstruction (%; N=136)

Satisfaction with:	Village 1	Village 2	Village 3	Village 4	Village 5	Average
House location	100%	99%	95%	100%	100%	99%
House size	83	86	95	96	100	90
Quality of materials	100	92	95	96	100	94
Construction quality	100	94	95	96	100	95
Average	95.75	92.75	95.00	97.00	100	94.50

Source: Household survey, December 2004–February 2005.

Note: All houses in village six were contractor-built, whereas in the other five villages some people rebuilt houses themselves with government support, or with their own resources.

Table 2: Positive and negative housing features mentioned by self-built house owners (%; N=136)

	Village 1	Village 2	Village 3	Village 4	Village 5
Positive features					
Earthquake-resistant housing	78%	90%	100%	67%	71%
House is commensurate with rural lifestyle	4	5			
Availability of storage space	5		4		
Future upgrading is feasible		5			
Plastering is provided			8		
Wooden doors and windows are provided					14
Flat slab roof is provided					14
Negative features					
No negative features	56	52	40		57
No compound wall				50	
External kitchen not provided or is too small	8		16		
Cracks in the house	5		16		
Inadequate storage space		19	12		
Leakage in roof and walls		5			
House does not have <i>Chali</i> (veranda)					14
No colour-wash provided				17	14

Source: Household survey, December 2004–February 2005

between the government, civil society organisations and international agencies over whether the government should shift to a more supportive policy which sought to help people according to their economic capacity.⁹ This debate reflects the growing recognition that better-off households face higher losses in disasters for the simple fact that they own more. However, thanks to their social and economic capital they are less vulnerable to the long-term negative impacts that often lead to the irreversible impoverishment of poorer households.¹⁰ Although the government did not accede to pressure to change its compensation policy, the minimum level of help on offer – Rs40,000 – was enough to build a new, seismically safe small house that constituted an improvement on pre-earthquake housing for this group.

Another problem with the government's compensation policy was that households that were not formally registered with the *Panchayat* were not entitled to any compensation. We could not find any statistical data to quantify this problem, but in each village a certain number of households were affected, particularly in poor communities in remote areas, semi-nomadic groups and newly migrated people. From the government's point of view, not providing compensation for houses that officially did not exist may have been logical, but in practice it meant that vulnerable people in particular were left without any financial or technical help.

Construction quality

Our detailed observations of owner-reconstructed houses indicate that the quality of construction in most cases was good, and that the houses were seismically safe. High-quality construction was achieved thanks to strict building codes and good technical assistance and supervision. The disbursement of financial assistance in tranches also helped to ensure good construction quality and seismic safety. Owners of self-built houses showed a high level of awareness of seismically safe construction, and were familiar with retrofitting techniques through steel bands and gable bands.

Cultural and environmental sensitivity

People were familiar with the main reconstruction materials, and the use of vernacular designs and spatial arrangements ensured that villages reconstructed with government financial assistance maintained their traditional character.

Targeting vulnerable groups

The government's housing programme did not take account of the special needs of particularly vulnerable individuals or groups who may not have had the capacity to undertake building work themselves, or to manage and supervise the building process. The inhabitants of one of

the villages in which we conducted a PRA had never had the resources to construct high-quality dwellings, and hence lacked construction experience. Out of 19 households in the village, nine turned to a local contractor, who did very poor-quality work. As the first instalment of government assistance was not enough to allow them to progress work to the point where the next instalment could be released, they received no more money. As a consequence, their present housing situation is still very poor. Although our research supports these observations in only one village, they suggest one potentially serious risk of owner-driven approaches; the subsidiary approach

described in the next chapter may be one way to overcome these limitations.

Repairing and retrofitting damaged houses

The government's housing restoration effort mainly concentrated on the reconstruction of destroyed homes. Much less attention was given to the repair and retrofitting of damaged buildings. This bias towards the reconstruction of new houses marked not only the government's housing programme, but also – even more so – the programmes implemented by most NGOs.

Chapter 3

The subsidiary housing approach

Several NGOs in Gujarat adopted a subsidiary housing approach. These NGOs, which were active in livelihood programmes targeting disadvantaged communities before the earthquake, did not engage directly in housing reconstruction, but instead assumed a subsidiary role, complementing government compensation with additional material and technical assistance, within the framework of the government’s housing reconstruction programme. Essentially, these agencies were concerned to ensure that communities facing a precarious housing situation before the earthquake were assisted in claiming and using the government compensation they were entitled to under the government’s reconstruction scheme. In the context of Gujarat, this approach appears to have been an effective way of improving the housing conditions of disadvantaged communities, and strengthening their livelihoods.

SHA’s subsidiary housing reconstruction programme

This case study focuses on an NGO (called ‘SHA’) which offered post-earthquake housing assistance to seven remote hamlets in Rapar Taluka (Kachch district), inhabited by a total of 270 households. Our research looked specifically at two remote hamlets, and our survey covered a sample of 21 households. The NGO provided construction materials worth Rs25,000 per household and some technical guidance. Approximately 20% of the households in these villages were not entitled to any government compensation because their dwellings were not officially registered. To these households, SHA offered full housing



An SHA house in Rapar Taluka (Kachch district)

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reconstruction assistance. SHA’s housing reconstruction assistance was embedded in livelihood projects focusing on sustainable agricultural development, and water resource development for irrigation and domestic use. SHA also engaged in drilling wells, re-excavating ponds, constructing contour bunds and distributing seeds and agricultural implements.

Issues, achievements and constraints

Beneficiary satisfaction

As shown in Table 3, the level of satisfaction among citizens that benefited from housing assistance under this approach was very high. Furthermore, all households considered their present housing situation to be better than it was prior to the earthquake. Since the housing assistance received from the NGO was in addition to government compensation, it is not surprising that this approach scored slightly better than the government-supported, owner-driven reconstruction programme.

Table 3: Satisfaction with subsidiary housing reconstruction (%)

Satisfaction with:	Subsidiary approach (N=21)		Full NGO reconstruction (N=6)		Average
	No.	%	No.	%	
House location	20	95	5	83	89
House size	20	95	4	67	81
Quality of materials	20	95	6	100	97.5
Construction quality	20	95	6	100	97.5
Average	20	95	5.25	97	91.25

Source: Household survey, January–February 2005

Note: The NGO constructed complete houses for six households covered by our survey because they were not entitled to government compensation.

Targeting vulnerable communities

The communities in which SHA worked were very poor and remote: 96% of the inhabitants of the two hamlets covered by our research belong to the Koli community, one of the most deprived groups in Gujarat. Most are engaged in seasonal migration, finding employment in the production of coal or salt. Their housing conditions prior to the earthquake were very poor; nearly 22% of households in these hamlets would not have been entitled to any compensation because their houses were not registered. SHA directly engaged in housing reconstruction for these households, adopting a participatory housing approach by involving house owners in construction. However, people had no major say in the design and size of the house. Our research (shown in Table 4) indicates that SHA performed better in supporting self-built housing than when it assumed a leading role in construction, reconfirming people's preference for owner-driven reconstruction.

Construction quality

The quality of construction in these villages was comparable with the quality of construction under the owner-driven housing reconstruction approach. Most people were satisfied with the quality of construction.

Overcompensation

SHA assumed that people belonging to minorities and underprivileged groups would be neglected by the government. This turned out to be less of a problem than expected. In fact, with the financial compensation they received from the government plus NGO support, many families managed to construct two houses, with the result that, in the hamlets covered by SHA, there were almost double the number of houses than before the earthquake. Nevertheless, it was found that 100% of the houses were occupied, which indicates that improving the housing situation in these communities was a necessity.

Table 4: Positive and negative features mentioned by house owners in SHA villages (%)

Positive features	Material support only (N=21)	Provision of full house (N=6)
Earthquake-resistant	90	67
Commensurate with rural lifestyle	5	–
Possible future up-grading	5	–
Flat roof		17
Negative features		
No negative features	52	50
Insufficient storage space	19	33
Leakage from roof and walls	5	
Not earthquake-resistant	17	

Source: Household survey, December 2004–February 2005

Chapter 4

The participatory housing approach

Our third case study looks at the participatory housing approach adopted by an important Gujarati NGO (referred to here as 'PHA'). Most NGOs involved in housing reconstruction in Gujarat claimed to follow a participatory approach. What that meant, however, varied significantly. For some agencies, 'participation' involved discussing reconstruction plans with the village elite, without offering even these selected citizens the opportunity to put forward alternatives. Others adopted a participatory approach in the finalisation of house designs, but allowed no further involvement by communities once designs had been approved. Still others called their approach 'participatory' when what they meant was that they expected free labour from house owners.

This paper defines participatory housing as an approach in which the NGO, although assuming a leading role in housing reconstruction, does not engage a professional contractor and gives a major emphasis to involving house owners in project planning, housing design and construction. This approach can be seen as a pragmatic compromise between the owner-driven approach and the contractor-driven approach.

PHA's participatory housing programme

PHA had experience in providing low-cost housing for disadvantaged communities prior to the earthquake. After the earthquake, it carried out its own damage and needs assessment, identifying 30 villages for reconstruction, totalling 3,000 homes. Our case study covers one village in Patan district, where PHA rebuilt 457 houses. Before the earthquake, the village had comprised about 500 mud-built houses, meaning that the NGO rebuilt about 90% of the pre-earthquake housing stock. PHA had been active in the village for about eight years prior to the earthquake, focusing on women's empowerment and micro-credit to promote income-generating activities.

PHA targeted poorer households on the ground that they could not rely on sufficient government compensation to restore or improve their housing on their own. It opted for traditional local construction techniques and materials (stone walls with cement mortar and tiled roofs), and trained and employed local labourers. Beneficiaries were involved in finalising designs, and house owners were expected to contribute labour throughout the construction period. Particular emphasis was given to training women. The agency provided an extendable core unit consisting of a living space of 20m², plus sanitary facilities (a single-pit pour-flush latrine), to which people could add additional rooms as their needs and circumstances allowed. Although



A PHA house in Patan District

the emphasis was on traditional techniques, some innovations were introduced, such as a roof rainwater harvesting system connected to an underground water storage tank, plywood ceiling insulation for heat protection and mosquito screens. The total cost of PHA's core house including toilet and water tank was Rs47,000, 15% above the minimum financial compensation offered by the government. Many people who received housing assistance from PHA also benefited from government compensation.

Besides housing, PHA also restored community infrastructure, such as check-dams (small dams built across a stream to create a small water reservoir), ponds and wells, and built community centres. As with the housing programme, a participatory approach was adopted: each scheme was proposed by the community, which had to contribute 10% of the total cost through the provision of free labour.

Issues, achievements and constraints

Beneficiary satisfaction

The level of satisfaction among people who received housing assistance from PHA was high. All completed houses were inhabited, and 91% of house owners reported that their housing situation was better than it had been before the earthquake. Many families added an additional room to the core unit, indicating that the concept of core housing was well understood and accepted. People were also generally appreciative of some of the innovations the agency introduced. Latrines, which virtually no one had before the earthquake, were considered 'very useful' by 59% of house owners, and 97% of the house holders that were given them were pleased with the underground tanks that the agency built. Training ensured that people were

aware that the tank needed to be disinfected regularly. Given the arid climate, very few people thought the roof rainwater harvesting system was useful, and none of the self-built houses in the village had similar structures.

Cultural and environmental sensitivity

The design and construction materials used by PHA were based on a deep appreciation of the functionality of vernacular housing and of the importance of ensuring continuity through culturally and environmentally sensitive design and building techniques. PHA proved that seismic safety can be achieved without the introduction of new building materials and techniques, and is not incompatible with traditional housing styles. PHA also showed sensitivity to health problems caused by local climatic conditions, adding new elements such as mosquito screens and measures to insulate against the heat.

Compulsory labour contribution in construction

There are a number of arguments against handing over to disaster victims ready-made houses without asking them to make any contribution. The provision of completely free housing increases external dependency and undermines local initiative. Making a contribution of free labour as a condition for obtaining a house discourages people who do not really need one to apply. Involving family labour in construction enhances the sense of ownership, improves quality control and makes future maintenance and repair



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An owner-built house (left) and a PHA house (right)

easier. Cost-sharing arrangements in cash, kind or labour also increase people’s control over NGOs, and hence NGO accountability.

PHA proved that it is possible to expect a labour contribution even from relatively poor communities, and from men as well as women. If house owners were busy, they found a relative or a neighbour to take their place. This made the construction of private housing into a collective activity, and appeared to reinforce community ties. We found that even old widows and female-headed households were able to make a contribution.

Table 5: Satisfaction with participatory housing (N=65)

Satisfaction with:	PHA (N=54)		Owner-driven approach (ODA) (N=25)	
	No.	%	No.	%
House location	52	96	25	100
House size	46	85	24	96
Quality of materials	50	93	24	96
Construction quality	50	93	24	96
Average	49.5	91.75	24.25	97.00

Source: Household survey, December 2004–February 2005.

Table 6: Positive and negative features mentioned by house owners in the PHA village (%; N=65)

Positive features		Negative features	
Earthquake-resistant house	80	No compound wall	48
Kitchen is provided outside	9	Insufficient storage space	24
Plywood heat insulation on the ceiling	22	Small size	9
Wooden doors and windows	15	Poor-quality flooring	11

Source: Household survey, December 2004–February 2005.

Training

PHA organised a comprehensive training programme in masonry skills for both men and women. This ensured high construction quality and seismic safety even in self-built houses. Training was appreciated because it enhanced the employment opportunities, skills and wage-earning capacity of formerly unskilled labourers. The construction sector in Patan district, as in the rest of India, is booming, and the demand for skilled construction labour remained high even four years after the earthquake.

Mobilising local resources for community development

Another achievement of PHA was its success in getting villagers to participate in restoring village ponds and

dams, which considerably improved the village's precarious water supply. PHA supported community infrastructure development projects identified by the villagers themselves. The donation of free labour for collective goods, known locally as *sramdan*, is deeply rooted in the local culture, and was effectively revitalised by PHA.

Overcompensation

Because PHA did not formally 'adopt' the village we looked at in our research, people received PHA housing assistance without having to give up their government compensation. However, rather than building a separate house with their government assistance, people generally used the money to add to the core unit provided by PHA.

Chapter 5

Contractor-driven reconstruction *in situ*

The fourth reconstruction approach used in Gujarat is referred to here as ‘contractor-driven reconstruction *in situ*’. Here, the task of housing reconstruction is given to a professional construction company, and housing design, construction materials and expertise are often brought in from outside the target community. The contractor-driven approach is generally chosen because it is considered the easiest and quickest way of providing housing and re-establishing normality after a disaster.¹¹ Using construction companies allows for the relatively rapid construction of large numbers of houses with standard specifications, using staff with technical expertise and specialist skills. This approach may be the best solution in contexts where knowledge of construction is limited to professionals, and where there is no tradition of community self-building. However, it also has several important drawbacks. As Barakat points out, large-scale contracted construction tends to adopt a ‘one-size-fits-all’ approach, which means that the specific housing needs of individual communities are not met, and diversity within the community is not taken into consideration.¹²

In Gujarat, contractor-driven building was used by large national or international NGOs and private corporations, which ‘adopted’ villages within the framework of the government’s regulated public–private partnership programme. Although agencies that opt for contractor-driven reconstruction tend to prefer to construct new villages on clear ground, public pressure meant that most rebuilding was done on existing sites (hence ‘*in situ*’).



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An incomplete CODIS house used for fodder storage

CODIS’ contractor-driven reconstruction programme

Our case study concerns a large national NGO (which we call ‘CODIS’) that took over the full reconstruction of over 3,000 houses in 11 villages. The research presented here covers one village near Bhuj, in which the NGO reconstructed a total of 799 houses. CODIS provided houses with a reinforced concrete cement (RCC) frame structure, using hollow cement blocks as walling material and flat RCC roofing. Construction work was given to a Delhi-based contractor through a formal tendering procedure, and the firm imported its own labour. Local participation in construction was not mandatory, but some households supervised the construction of their house and participated in curing the concrete.

According to CODIS’ initial survey, the village required 535 houses, but this was later declared incorrect, and an additional 264 houses were built. Like most agencies that adopted villages within the framework of the public–private partnership programme, CODIS built houses in three different sizes: 381 houses of 25m², 127 of 34.5m² and 27 houses of 37m². CODIS met the full cost of the smallest type of house (estimated at Rs85,000). People who opted for a larger house had to pay the balance of the additional cost with the first instalment of government compensation.

For each house size, CODIS proposed three or four slightly different designs, giving people



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Incomplete and unoccupied CODIS houses

the option to choose, for example, between having either a veranda or an additional room. Villagers could view models of the proposed houses in the village school, and could give their feedback before the design was finalised. This led for example to dropping the idea of constructing sanitary latrines inside the house. CODIS also encouraged the use of existing doors, window shutters and frames that survived the earthquake, to reduce costs and to achieve some continuity with pre-disaster housing.

Issues, achievements and constraints

Beneficiary satisfaction

Our research showed that the majority of beneficiaries were satisfied with the housing they received under the CODIS programme: 74% of households considered that their housing situation was better than before the earthquake, and 71.6% expressed overall satisfaction with their housing situation. Most people were satisfied with the location and size of the house. The flat roof was an innovative feature, and was used by beneficiaries to store or dry items. Several house owners liked the fact that their homes had the potential for upgrading. Some reported that they planned to add a second floor, indicating that the basic CODIS units lent themselves well to people’s incremental approach to housing.

Construction quality

A significant proportion (36%) of house owners were not satisfied with the quality of the materials used, and 31% were unhappy about the quality of construction. These figures compare poorly with the 100% satisfaction rating among people in the same village who had opted for owner-driven reconstruction. In part, poor construction



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An upgraded CODIS house

stemmed from a lack of water for adequate curing of the RCC constructions, leading walls to crack. However, our respondents believed that the contractor produced poor-quality work in an effort to maximise profits.

CODIS set up a village committee to supervise the building work, and encouraged house owners to monitor the contractor. However, this turned out to be a difficult task, and villagers could do little to influence the company. Almost a third of beneficiaries complained of leaking roofs, and a quarter were unhappy with the quality of their doors and windows. Latrines were particularly problematic, and 36% of households did not consider them useful at all. This low acceptance stemmed partly from the small size of the septic tank. The waterproof paint that was supposed to be applied to walls and ceilings, and for which CODIS had obtained the necessary funds, had in most cases not been applied. Most of the additional 264 houses built in the second round of construction were unoccupied and of significantly inferior

Table 7: Satisfaction with contractor-driven reconstruction *in situ* (N=166)

Satisfaction with:	CODIS		Owner-driven reconstruction	
	No.	%	No.	%
House location	152	95	6	100
House size	143	89	5	83
Quality of materials	102	64	6	100
Construction quality	111	69	6	100
Average	127	79.25	5.75	95.75

Source: Household survey, December 2004–February 2005.

quality; many were not completed. This additional construction also led to some families owning as many as six houses. In all, there were 67% more houses in the village after the CODIS programme than there had been prior to the earthquake.

Bias towards accessible and better-off communities

Contractors are reluctant to work in small remote communities, which are generally poorer than more accessible sites. One of CODIS' selection criteria was that the village should not be too far from Bhuj, and that it should have at least 100 households. In Gujarat, villages with these characteristics are generally not among the poorest. The village reconstructed by CODIS was better-off than the average, and significantly wealthier than the villages assisted by SHA and PHA.

Housing location

Prior to the earthquake, the bulk of the inhabitants of the CODIS village had spent most of the year in scattered *wadis* (farms), and only came to the village itself for religious festivals, private ceremonies and trading purposes. Many villagers would have preferred their new homes to be built in their *wadis*, but this was not accepted by the NGO and villagers thus ended up reconstructing their *wadi* houses themselves. This is one of the reasons why about 20% of the CODIS houses were unoccupied. Occupancy rates are

particularly low in the neighbourhoods belonging to the Ahir (farming) community, which constitutes 45% of the village population. Furthermore, as people had given up government compensation in favour of CODIS housing, they had to reconstruct their *wadi* houses without external financial and technical assistance.

Village layout and communal spaces

The fact that CODIS intended to reconstruct houses *in situ* led the agency to neglect the need for a settlement plan. The design effort focused on the houses, and little attention was paid to the village as a whole. This was particularly noticeable in relation to the NGO-constructed community hall, which was built on the village's former *chowraha* (plaza). The *chowraha* used to be the social, cultural and economic heart of the village. At its centre was a simple structure consisting of a tiled roof supported by wooden pillars placed on an elevated concrete base. On one side, there was a small house that served as a storage room, and a place where pilgrims, business people or other travellers could stay overnight, and at the centre of the *chowraha* was a *chabutera* (a bird house). However, instead of rebuilding the *chowraha* (as requested by the villagers), CODIS built the community hall, which is hardly ever used, and what used to be a lively village centre is moribund. People meet under a tree in the yard of the village's principal temple or under temporary structures. People remember the *chowraha* with nostalgia, and feel that their village no longer has a centre.

Table 8: Positive and negative features mentioned by house owners in the CODIS village (%; N=176)

Positive features	%	Negative features	%
Earthquake-resistant house	78	External kitchen is not provided	31
Plastering is provided	9	Inadequate storage space	49
Flat roof	17	Leaks in roof and walls	31
		Poor-quality doors and windows	26

Source: Household survey, December 2004–February 2005.

Chapter 6

Contractor-driven reconstruction *ex nihilo*

Contractor-driven construction *ex nihilo* differs from *in situ* reconstruction in that, instead of rebuilding the village on the same site, the new houses are relocated to a new site. The advantage of this approach is that it does not require the removal of rubble to clear the site, and the reconstruction plan is not constrained by any buildings that survived the earthquake. However, there is a growing awareness that resettlement is a traumatic experience, and may have a significant negative impact on people's livelihoods and social relations.¹³ This has led agencies such as the World Bank to introduce policies designed to prevent unnecessary resettlement.



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An empty CODEN house

As discussed in Chapter 2, people in Kachch fiercely opposed resettlement, which led the government to abandon its initial reconstruction policy, which was based on relocating communities to new sites. Some private corporations and large NGOs nevertheless pressed ahead with resettlement. This case study of the *ex nihilo* strategy focuses on a large NGO (which we will call CODEN) that adopted 11 villages and reconstructed a total of 2,250 houses. Our research covered three villages in which CODEN rebuilt 719 houses, plus community infrastructure.

CODEN's reconstruction programme

CODEN is a large NGO. In association with a large construction company, CODEN had rebuilt five villages comprising 2,000 houses after the 1993 earthquake in Maharashtra. Although the reconstruction approach pursued in Maharashtra has a number of problems and weaknesses, CODEN used the same strategy in Gujarat.¹⁴

CODEN reconstructed its villages on land that was either provided by the government, or which the community had purchased itself. Where land was provided by the government, people had to renounce their land rights in the old village. Full village reconstruction included infrastructure such as roads, schools, a community hall, a water supply system and drainage canals. CODEN's reconstruction plans in the three villages covered by this research envisaged three types of plots and houses:

- 100–150m² plots and 30m² houses, at a cost of Rs97,500, for 294 landless and marginal landholders;
- 250m² plots and 40m² houses, at a cost of Rs127,500,

for 215 households owning 1–4 hectares of agricultural land; and

- 400m² plots and 40m² houses, at a cost of Rs157,500, for 210 households owning more than 4ha of agricultural land.

The same plan was used for all villages, with the result that they all have exactly the same appearance. The plan consists of wide streets forming a grid pattern, and rows of flat-roofed RCC buildings. The larger plots and bigger houses are located at one end of the village, the smallest plots and smallest houses are at the other end, and medium-sized houses are in the middle.

Houses were distributed randomly among the villagers once construction was completed. 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 homeowners could not monitor progress informally.

Issues, achievements and constraints

Beneficiary satisfaction

In CODEN villages, dissatisfaction with the quality of materials and construction was very high, as shown in Table 9.* Frustration with the quality of construction was particularly evident among members of the Kadiya caste.

*The survey could be carried out in only two of the three villages. In one village the Sarpanch, under the influence of CODEN staff, did not allow the research team to carry out the survey with a random sample of households. He only allowed the team to speak with people of his choice and in his presence. Given these conditions, we decided against carrying out a survey in that village.

Skilled masons, Kadiyas accounted for the majority of the beneficiaries. Beneficiaries also complained that the new houses and settlements did not conform to their rural lifestyle, there was no privacy for women, and there was no space for cattle, fodder, agricultural implements and people’s furniture. Uniquely among the villages we looked at, a significant number of people were unable to mention any positive feature of their new house, and a high percentage of households explicitly said that their new home had no positive features at all.

Poor-quality housing in contractor-driven reconstruction projects is sometimes the result of an NGO’s inexperience in handling contractors; firms may be keen to save time and resources at the cost of construction quality. In this case, problems were exacerbated by a lack of accountability: the construction company had a close association with the NGO, and was given the contract without going through any regular tendering procedure.

Resettlement

As discussed above, there was significant opposition to resettlement in Gujarat, and only 23 villages in Kachch (9% of the total) were reconstructed via resettlement. People in CODEN villages told us that there had been no community

consultation about relocation, and no alternatives to resettlement were presented to them.

Relocation made some sense in only one of the three villages we looked at. However, relocation stemmed not from the earthquake, but because the old village was at risk of flooding due to the construction of a dam. Prior to the earthquake, the Irrigation Department, which provided land for the new site, had been trying to persuade villagers to relocate, but lack of support and financing for relocation had encouraged it to look into alternative solutions, such as building a dyke. After the earthquake, relocation became a more viable option, but there was no consensus around where the new site should be located. About 30 households in the village demanded houses in another location nearer to their agricultural land, but they were told that, if they wanted assistance, they had to move to the reconstruction site proposed by CODEN. Eventually, the 30 households built their own hamlet in a location better suited to their livelihood activities.

In the second village, it was argued that resettlement was necessary because the old village was on seismically unsafe ground (a claim that does not seem to have been supported by any scientific assessment). The village was very old, and well-known for its wealth and beauty. In the

Table 9: Satisfaction with contractor-driven reconstruction *ex nihilo* (N=77)

	Village A				Village B			
	CODEN (N=20)		Owner-driven reconstruction (N=7)		CODEN (N = 50)		Owner-driven reconstruction (N=0)	
Satisfaction with:	No.	%	No.	%	No.	%	No.	%
House location	13	65	7	100	32	64	NA	NA
House size	10	50	7	100	26	52	NA	NA
Quality of materials	7	35	7	100	21	42	NA	NA
Construction quality	1	5	7	100	1	2	NA	NA
Average	7.75	40	7	100	20	40	NA	NA

Source: Household survey, January–February 2005.

Table 10: Positive and negative features mentioned by house owners in CODEN villages (%)

Positive features	V1	V2	Negative features	V1	V2
Earthquake-resistant house	82	40	External kitchen is not provided	34	25
Plastering is provided	2	–	Leaks in roof and walls	76	60
Provision of toilet and bath	–	5	No compound wall	–	25
No positive feature	14	35	Small room size	16	–
			Not suited to rural lifestyle	16	
			Poor quality doors and windows	18	
			Height of plinth is inadequate	16	

Source: Household survey, December 2004–February 2005.

third village, there appeared to be no justification and even less public support for relocation. The government provided no land for the new site, and people had to purchase a plot at their own expense (many people had to take out loans from money-lenders at exorbitant rates of interest). Judging from its present appearance, the old village was not severely damaged, and most people simply refused to move, preferring to repair their old homes themselves. In this village, about 75% of new houses were empty, and some houses have already been sold at prices well below the cost of construction. Repairing or reconstructing the old houses was not possible in the other two villages, where people had to give up their old property rights in order to obtain land for the new settlement. Accordingly, occupancy rates in the surveyed village were higher, with only about 18% of houses unoccupied at the time of the household survey.

Exploitation of assistance by village elites

The villages reconstructed by CODEN were by far the wealthiest of all the settlements we looked at during our research. They enjoyed good access to fertile agricultural land and irrigation, and a high proportion of their inhabitants were large landowners. Within the villages themselves, CODEN's approach inherently favoured better-off households, who received larger plots and bigger houses. CODEN staff justified this on the grounds that, in an unequal society like Gujarat's, it was not possible to treat everyone equally. The agency may also have followed the Maharashtra example and assumed that large landowners by definition needed more space than landless households for animals and agricultural implements.



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A CODEN village

This argument does not hold on a number of grounds. First, livelihood strategies are increasingly diverse, and large landlords are often not involved in agriculture at all, instead renting out their land to landless tenants. Second, many landless castes, such as weavers and carpenters, practice their trade in their homes, and so may need more space than richer landlords. Finally, this approach tends to neglect the fact that wealthier households are endowed with financial and social capital that makes them less reliant than poor households on external aid to restore their livelihoods.¹⁵

CODEN claims that it conducted a systematic consultation with all communities in the three villages on critical issues such as relocation, village layout and housing design. The majority of the villagers we spoke to, however, felt that they had had no say in whether their village should be adopted by CODEN to begin with, and were not consulted on any issues arising as the reconstruction process progressed. People in all three villages were very outspoken about the vested interests of the local elite, and maintained that the most influential people got personal benefits from persuading villagers to accept CODEN adoption. Certainly, influential individuals enjoyed luxurious residential areas created with NGO support. In one village, the local elite had added toilets and bathrooms, beautifully finished compound walls, flowers and trees, luxurious gates, 'offices' to receive guests, parking space for their cars and sheds for their cattle.

We found that the local elite obtained more than one plot and house by registering them in the name of people who had no entitlements (under-age children living with their parents or relatives who did not live in the village). Two brothers told us that they had obtained a plot of 12,000 square feet and two additional



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Empty CODEN houses

houses in the name of two brothers living in Ahmedabad. In the same neighbourhood, we met two women who told us that their husbands had used the same device to obtain four houses and homestead plots of 10,500 square feet. Another woman proudly told us that, in the name of different family members, her family had managed to acquire three houses in their own village and an additional three houses in another CODEN village, where none of them was living. Unsurprisingly, the less fortunate resented the way the more powerful members of the villages seemed to exploit the system.

Interference in local social organisation

Although the caste system is a classic example of a highly stratified society, social injustice and inequality are not inherent to it. Castes are first and foremost groups of people connected to each other through kinship and common ancestry. Each caste has its unique customs and beliefs, which find expression partly in different housing styles and settlement patterns. Castes do not consist of socially or economically homogeneous groups of people. Within a group belonging to the same caste, some families are endowed with more social and economic capital than others, which gives them an obligation to provide patronage to weaker caste members. Therefore, families belonging to the same caste prefer to live close together.¹⁶

Project documents indicate that CODEN was aware of the importance of castes in rural India. The NGO appeared to attribute to the caste system all the evils of Indian society, thereby underestimating the importance of economic inequality. By reorganising the village territory according to socio-economic categories, it attempted to replace a caste-based spatial organisation with a class-based one. It is beyond the scope of this study to assess whether a class society is more legitimate than a caste society. However, any attempt to introduce such dramatic social change is unlikely to succeed; in this case, it made people unhappy and made no contribution to reducing socio-economic vulnerability. On the contrary, in fact: families who were isolated from their communities expressed a sense of solitude and insecurity. This problem was felt in particular among women, whose life is often confined by the boundaries of their neighbourhood.

The fact that the new settlement does not allow people to live near their relatives and community members is one of the factors contributing to low occupancy rates and to the sale and exchange of houses. In one village, occupancy rates were around 20%, and many people preferred to repair their old homes rather than live in the new ones. Occupancy was higher in the other two villages, where people were able to buy land from the government on which to build the new settlement. However, purchases were conditional on people surrendering their old property rights to the state.

Chapter 7

Overall findings and conclusions

I have tried to demonstrate that men, women, and their children have both the capacity and the desire to shape their personal environments and to relate them to those of other members of their societies. Traditionally they have had the skills and competence, the sensibility and the know-how to build them effectively with regard to land, the climate, and the resources they have at hand. Embodying the values and needs that are special to them, they have built homes in ways that have often achieved, in their integrity and authenticity, beauty of form and harmony of design.¹⁷

The reconstruction effort in post-earthquake Gujarat was broadly successful. According to the GSDMA, by December 2005 the government had supported repairs to 908,710 of the 917,158 homes damaged in the earthquake, and had fully rebuilt 197,091 destroyed homes, out of a total of 222,035. NGOs had constructed 36,901 houses, just short of the target of 37,150 set under the public-private partnership programme.¹⁸ Although the government does not give figures for reconstruction work outside the partnership programme, it is known that NGOs working in Kachch had finished 39,263 houses by March 2003, out of a planned total of 48,495.¹⁹ Over 70% of repair and reconstruction work was completed by the beginning of 2003, just two years after the earthquake.

In qualitative terms too, the results appear positive. Over 95% of homes complied with government building codes, and in 2003 the GSDMA was awarded the UN's Sasakawa Award for outstanding work in the field of disaster management and risk reduction.²⁰ Research for this paper broadly supports the view that housing was satisfactorily restored after the earthquake, and that, thanks to the concerted efforts of local communities, NGOs, the government of Gujarat and international humanitarian and development agencies, affected people were not forced to sell assets to finance the rebuilding of their homes. As Table 11 (p. 24) shows, almost 80% of households thought that their housing situation was better than before the earthquake. Over 53% of the households reported that their economic situation had remained unchanged, and nearly 21% considered that it had improved.

Table 12 (p. 24) summarises the findings of our research into different housing approaches. It paints a clear and coherent picture. The highest level of satisfaction was achieved with what we have called the 'subsidiary housing approach'. In these 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 households were fully satisfied. Households that benefited from this assistance belonged to the poorest and most

neglected communities in rural Gujarat. The subsidiary housing approach proved an effective way to mitigate some of the risks of the owner-driven approach. Under the subsidiary approach, the NGO does not aim to compete with or replace the state, but to complement its role by providing support to the most vulnerable to obtain the goods and services to which they are entitled. It requires from NGOs a commitment to look for the most vulnerable people or communities, and a focus on people whose official compensation entitlements are not sufficient to meet specific needs. Such an approach may change the balance between capital investment and investment in human resources, because it means supporting small and scattered projects, which entail higher personnel costs.

The government-supported owner-driven approach was almost as popular as the subsidiary approach, with 93.3% of households reporting themselves satisfied with their housing situation. In all the villages we looked at, NGOs had also been active in housing reconstruction, giving people an opportunity to compare the advantages and drawbacks of the two different approaches. Their high level of satisfaction thus expresses not only an absolute preference for the owner-driven approach, but also a relative preference. The owner-driven approach is empowering and participatory, and thus should be welcomed by NGOs, which consider community empowerment and participation as being among their main objectives. Many NGOs, however, are reluctant to embrace cash approaches like owner-driven reconstruction. This reluctance may be related to a lack of experience and to limited research into such approaches. We hope that this paper will increase confidence in the viability and effectiveness of cash-based approaches to housing reconstruction, and prompt NGOs to reconsider their own roles and approaches in this area.

The third approach looked at in this paper was the 'participatory housing approach'. Here, overall satisfaction levels averaged 90.8%. This 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 housing which, in terms of construction, design and materials, did not differ much from houses reconstructed under the owner-driven approach. People who obtained houses under this approach got training in seismically safe construction, which could easily be integrated with their traditional building techniques, and which hopefully will make future additions safer. The only area in which this approach scored poorly was in relation to the size of the houses provided. However, the PHA houses were conceived of as extendable core units, and cost only Rs47,000, about half the cost of the houses constructed under the CODIS approach and 38% of the cost of the average house constructed under the CODEN approach.

Table 11: Perceptions of housing and socio-economic situation (%)

	Village 1	Village 2	Village 3	Village 4	Villages 5+6	Average
Housing						
Better	83	100	91	74	49	79.4
Same	12	0	2	13	19.5	9.3
Worse	2	0	6	10	25	8.6
No response	1	0	0	1	3	1
Economic situation						
Better	10	48	26	7	13.5	20.9
Same	64	48	49	39	65.5	53.1
Worse	24	4	23	52	16.5	23.9
No response	1	0	0	2	1	0.8
Village environment						
Better	61	81	86	58	51	67.4
Same	30	19	9	18	10	17.2
Worse	7	0	3	22	34	13.2
No response	1	0	0	1	1	0.6
Health						
Better	30	44	49	36	16.5	35.1
Same	48	48	43	45	63.5	49.5
Worse	20	7	5	16	15	12.6
No response	1	0	0	2	1	0.8
Education						
Better	84	85	94	68	65	79.2
Same	13	11	2	13	20	11.8
Worse	0	0	0	9	2	2.2
No response	2	4	3	8	9.5	5.3

Source: Household survey, December 2004–February 2005.

Table 12: Satisfaction with different reconstruction approaches: overall findings (%; N=434)

	ODA	SHA	PHA	CODIS	CODEN
Financial support per housing unit (Rs)	40,000–90,000	40,000 from the government + 25,000 from the NGO	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

Table 13: Number of dwellings before and after the earthquake by housing reconstruction approach (N=434)

	Number of households	No. of dwellings before the earthquake	Dwellings/ household before the earthquake	No. of dwellings after the earthquake	Dwellings/ household after the earthquake	Increase (No.)	Increase (%)
PSPS/ODA	89	112	1.25	130	1.46	18	16.1
SHA	27	34	1.25	66	2.44	32	94.1
PHA	65	86	1.32	124	1.90	38	44.2
CODIS	176	253	1.44	422	2.44	169	66.8
CODEN	77	117	1.52	213	2.76	96	82.3
Total/Average	434 (Total)	602 (Total)	1.38 (Average)	955 (Total)	2.20 (Average)	168 (Total)	60.7 (Average)

Source: Household survey, December 2004–February 2005

Among the two contractor-driven approaches reviewed by this study, 71.8% of households expressed overall satisfaction with their housing situation under the CODIS approach. However, while people were generally happy with the location and size of their homes, they were less pleased with the quality of materials and construction, which are the main factors used by humanitarian agencies to justify employing professional construction companies. Contractors prefer industrial construction materials and technologies, which may not be suited to the local climate. The profit imperative may also compromise the quality of the work.

Finally, CODEN. This was by far the least popular approach. In these villages, only 22.8% of people were satisfied with their housing. Since the main difference between CODIS and CODEN reconstruction concerned resettlement, we might expect location to be the key issue. In fact, however, this was not the case. Dissatisfaction and frustration in the CODEN villages was linked to a wide range of issues. The majority of households reported problems, such as cracks in walls and ceilings, leaks and poor-quality doors and windows. Only 3.5% of households said they were satisfied with the construction. People also complained about lack of participation, the elite capture of decision-making and project benefits, bald discrimination in favour of the local elite and the disruption of family networks. Where people had the option of staying in their old houses, they refused en masse to move to the new village.

It is perhaps ironic that the project that enjoyed the least appreciation among its beneficiaries was on average by far the most expensive, costing around three times more than the non-contractor projects. In addition, while in each case there was a significant increase in the number of post-earthquake houses compared to pre-earthquake levels, the most striking disparities are in the CODEN villages. Whereas in the villages which were assisted through a subsidiary approach the increased housing may to some extent be attributed to poor housing conditions prior to the

earthquake, this was not the case in the CODEN villages, where levels of housing before the earthquake were satisfactory.

This study provides empirical evidence that the growing trend towards financial support to owner-driven post-disaster housing reconstruction is socially, financially and technically viable. It shows that, in a context where people are traditionally involved in building their own dwellings, given adequate financial and technical support they have the capacity to construct houses that are more likely to respond to their needs and preferences than houses provided by outside agencies. The study confirms many of the drawbacks and risks associated with a contractor-driven approach: inflexibility, cultural insensitivity, failure to adapt to local conditions, and a tendency to introduce external construction materials ill-suited to the local climate, and which are difficult to maintain and upgrade.

These conclusions are not based on project evaluations by 'experts', but on what affected people themselves thought about different post-disaster housing reconstruction approaches. The clear conclusion is that the cheapest approach to post-disaster housing reconstruction was the most effective in reaching the most neglected communities, and addressing their housing requirements. Conversely, the most expensive approach may have made the rich richer, and the poor more vulnerable. Funding agencies and NGOs should reconsider their role in post-disaster housing reconstruction and support people's own initiative, rather than providing them with what outside agencies believe is good for them. Cash-based approaches are viable in emergencies, are more empowering and more dignifying. These goals are fully in line with most NGOs' objectives, but need to be translated into operational strategies. We hope that this study, by allowing hundreds of people to tell us what they needed to restore their livelihoods, will encourage agencies to look again at how they respond to housing needs after disaster.

Annex 1

Checklist for village profiles

1. General situation before and after the earthquake

- Human population by community and occupation
- Migration
- Animal population
- Total amount of agricultural land
- Dry land
- Irrigated land
- Type and number of irrigation systems
- Crops cultivated on dry land
- Crops cultivated on irrigated land
- Type and number of irrigation schemes
- How many farmers own irrigation schemes?
- For how long have they practiced irrigation?
- Original village layout, with hamlets and related population
- Domestic water sources and supply systems
- Communal infrastructure (schools, temples, *chowraha*, etc)

2. Domestic water supply situation

- What was the drinking water situation before the earthquake? Quality? Quantity? Seasonal problems?
- Where did people of different communities and hamlets get drinking water?
- Where did they get water for washing clothes, bathing and for their animals?
- How far did they have to walk to fetch drinking water?
- How was the domestic water situation 10 years ago?
- What changes occurred in the water supply situation, and how did it affect their lives?
- What problems are they facing due to water problems?

3. Earthquake

- What happened?
- Number of casualties and wounded people
- Did animals die?
- Damage to public infrastructure and services:
- temples
 - mosques
 - markets
 - water supplies
 - electricity
 - public telephones
 - post offices
 - roads
 - health centres
 - schools
- Damage to houses by neighbourhood

4. Emergency aid: local initiatives

- What were the immediate needs and problems?
- How did the community respond to those needs?
- Who took initiative and leadership in organising emergency aid?
- What difficulties and constraints did they face in providing emergency aid?
- What among the items and skills needed to provide emergency aid were available, and what was missing?

5. External emergency aid

- When did the first external relief arrive?
- What type of government relief did you receive? When?
- What other agencies provided relief to this village? What (e.g. food, temporary shelters, clothing, water)? When? How long?
- Did some volunteers from outside come and stay in your village for some time? What did they do? How long did they stay?
- Was there a FFW programme?
- Did some agencies provide cash relief?
- Who did what and when?
- How/by whom was external relief coordinated?
- Was relief adequate? What was good, what was not so good?

6. Disruption of daily life

- How long was communication with the outside world disrupted?
- How long were water, electricity supplies, etc disrupted?
- How long were schools closed?
- How long were health centres disrupted?
- How long were markets disrupted? Why?
- How did the earthquake affect agricultural activities?
- How did the earthquake affect animal husbandry?
- What other activities and occupations were disrupted? For how long?
- When did life return to normal? What remains the same? What changes in your daily life have occurred since the earthquake and why?

7. General questions about govt. compensation, NGO adoption and relocation

- What government compensation were you granted for the reconstruction of your houses?
- What government compensation did you receive for the reconstruction of your houses?
- How many agencies came to offer their assistance for the reconstruction of your village?

- What did they offer?
- How and why did you decide on this particular agency?
- Why did you decide to relocate your village?
- Did all villagers agree?
- Did some households or communities refuse to join this reconstruction programme? Why?
- How did you get the land for the new village?
- How was the layout of the village decided?
- Are you satisfied with the layout of the village?
- Positive and negative aspects of new village site
- Are some communal facilities missing? (*chowraha*, market place, solid waste disposal, etc.)
- If you could go back in time, would you again decide to relocate?

8. Repair and reconstruction of community infrastructure

- What repair and reconstruction works were done? By whom?
 - Schools:
 - Temples:
 - Mosques:
 - Markets:
 - Roads:
 - Telephones:
 - Post offices:
 - Water supply systems:
 - Health centres:
 - Tree planting:
 - Others:
- How and by whom were these works decided?
- How was the location decided?
- Satisfaction with design, location, quality of construction and present functioning

9. Repair and reconstruction of private houses

- How many pre-earthquake houses were repaired in this village? By whom?
- How many houses were reconstructed in this village? By whom?

- What type of houses?
- How was the location decided?
- Are they satisfied with the location of the houses?
- How was the design of the house decided? Were you involved? How?
- Are they satisfied with the design of the house?
- Who constructed the houses?
- Was the community involved with the selection of contractor?
- Are they satisfied with how decisions were taken?
- Did they face any problems with the contractor?
- What was the role of the community and of future house owners during the construction period?
- What was the role of future house owners during the construction period?
- How good is the quality of the construction?
- Did they have a formal responsibility in quality control?
- When were houses completed?
- When did they take over the houses?
- What is their opinion about the latrines? Are they sufficient or too many? Are they used?
- Do they know/were they told how much money was given for the reconstruction of their village? Did they have any control/information about financial issues?
- If they had been given the money instead of what they have been given, how would they have reconstructed their houses and village?

10. Present situation and general questions

- At present, what are the main remaining problems of the village:
 - In relation to the earthquake:
 - Not in relation to the earthquake:
- Can you give us the name of a village nearby which according to you has been better rehabilitated than your village? What is better there?
- Can you give us the name of a village nearby which according to you has been worse rehabilitated than your village? What is worse?
- Can you give us the name of a village nearby which was reconstructed without NGO help? What is your opinion about that village?

Annex 2 Household questionnaire survey

Village name: _____ Name of the interviewer: _____

Date: _____ Survey number: _____

I. GENERAL INFORMATION:

1.1 Name of the household head: _____ 1.2 Name of the respondent: _____

1.3 Relation with the H/H head : _____ 1.4 Name of the community: _____

1.5 Official Status Gen/OBC/BC/SC/ST/NT _____ 1.6 Religion: Hindu/Muslim/Other Specify _____

1.7 Location of residence: _____

II. SITUATION OF THE HOUSEHOLD BEFORE AND AFTER THE EARTHQUAKE:

2.1 Situation pre- and post-earthquake: _____

Sr. No.	Name	Rel. to H/H	Age	Source of Income			
				At Present		Before Earthquake	
				Primary	Secondary	Primary	Secondary

2.2 Ownership of land and other assets before and after the earthquake:

	Before Earthquake	After Earthquake
<i>a) Agricultural Land (in acres)</i>		
1. Irrigated land		
2. Dry land		
<i>b) Livestock</i>		
1. Cow		
2. Buffalo		
3. Sheep/goat		
<i>c) Ownership of Shops</i>		
1. Type and value of shop building		
2. Value of goods stored		
3. Monthly sales		
4. Monthly income		
<i>d) Other Assets (e.g. cart, tractors, motorcycles, flour mill?)</i>		

2.3 Give details about the houses you owned **BEFORE** the quake

Property No.	Owner's Name	House Type*	Construction Year	Plot Area	House Area	No. of Rooms	Dist. from from Village Centre	Damage Category**
1								
2								
3								
4								

*) House Type 1: kutcha; ,2: Semi Pucca; ,3: Pucca

***) Damage category: As assigned by govt.

2.4 Give details about the houses you owned **AFTER** the quake

Property	Owner's Name	Repair/ Reconst/ Abandon	If Reconst: In situ/ Ex situ	If Ex-situ: Dist. from Village Centre	Type of const.	No. of Rooms	Size
1							
2							
3							
4							

2.5 Where did your family primarily live **BEFORE THE** earthquake?

a) Village b) *Wadi* c) Other Places (give details) _____

2.6 Where did your family primarily live **AFTER** the earthquake?

a) Old Village b) New Village c) *Wadi* d) Other Places (give details) _____

2.7 Before the earthquake, did you have any outstanding loans? YES/NO _____

If yes, give details:

	Purpose	Source	Amount outstanding at the time of earthquake	Amount outstanding today
Loan 1				
Loan 2				
Loan 3				
Loan 4				

2.8 As a consequence of the earthquake did you take any loans? YES/NO

If yes, give details:

	Purpose	Source	Total amount taken	Amount outstanding today
Loan 1				
Loan 2				
Loan 3				
Loan 4				

III. DIRECT LOSSES INCURRED DUE TO EARTHQUAKE:

3.1 Did any of your household members die during the earthquake? YES/NO _____

If yes, give details:

a) Age: _____

b) Relation to h/h head: _____

c) Occupation: _____

d) Expenses related to the death: _____

Own Expenses	Rs.
Assistance by Government, NGO & others	Rs.

e) Any permanent loss of income due to the death? YES/NO _____

f) Did you receive any compensation for the death of the family member? YES/NO _____

If yes, Amount: _____ Source: _____

3.2 Were any of your household members injured during the earthquake? YES/NO _____

If yes, give details:

a) Age: _____ b) Relation to h/h head: _____ c) Occupation: _____

d) Expenses related to the his/her medical treatment

Own Expenses	Rs.	
Assistance by Government, NGO, others	Rs.	

e) Did the injury cause any loss to the h/h income? _____

(1: Temporary loss, 2: Permanent loss, 3: No loss)

3.3 Loss or damage caused to other assets due to earthquake:

Sr. No.	Asset	No./Qty. (unit)	Nature of damage
1.	Cows		
2.	Buffaloes		
3.	Goats/Sheep		
4.	Seeds		
5.	a) Indigenous agriculture Implements		
	b) Iron modern implements		
6.	a) Well		
	b) Bore well		
	c) Pump room		
	d) Pump & motor		
7.	Tractors		
8.	Motorcycle		

3.4 Did the quake disrupt any of your household members' regular activities? If so, for how long? With what consequences/ losses?

Sr. No.	Relation to h/h head	Type of disruption	Time span
1.			
2.			
3.			
4.			
5.			
6.			

IV. HOUSEHOLD COPING MECHANISMS:

4.1 As a consequence of the earthquake, did you sell any land or other assets? YES/NO

If YES, please give details:

Sr. No.	Asset	Quantity	Amount received
1.	Land	Acre	
2.	House	Nos.	
3.	Cow	Nos.	
4.	Buffalo	Nos.	
5.	Goat/sheep	Nos.	
6.	Seeds	Y/N	
7.	Furniture and household implements	Y/N	
8.	Agricultural implements	Y/N	
9.	Tractor	Y/N	
10.	Motorcycle	Y/N	
11.	Jewellery	Y/N	
12.	Others		

4.2 As a consequence of the earthquake did you and your family members migrate? YES/NO _____

If yes, give details: _____

4.3 As a consequence of the earthquake did you and any of your family members return from outside? YES/NO _____

If yes, give details: _____

4.4 Did your family spend own money to restore your properties? YES/NO _____

If yes, How much money did your family spend to restore your properties?

Sr. No.	Property	Amount spent
1.	House	
2.	Shop	
3.	Agricultural assets	

4.5 Did you receive any financial or material help from the relatives/friends? YES/NO

If yes, give details

Sr. No.	Nature of assistance	Amount received
1.	Financial	
2.	Material	
3.	Others (Please Specify)	

V. GOVERNMENT REGISTRATION AND COMPENSATION OF LOSSES:

5.1 Did government made an assessment of the damage to your properties? YES/NO _____

If NO, state why _____

5.2 Were you satisfied with the assigned damage category and estimated value for your property? YES/NO _____

If YES, go to q. 5.5. If NO, state why _____

5.3 If you were not satisfied with the initial evaluation did you go for reevaluation? YES/NO _____

If NO state why _____

5.4 If resurvey is done were you satisfied with the reevaluation? YES/NO _____

If NO state why _____

5.5 Are you satisfied with the overall compensation? YES/NO _____

If NO state why _____

5.6 Did you receive full government compensation?

YES/NO _____

If NO state why _____

VI. HOUSING RECONSTRUCTION:

6.1 How was/were your house(s) reconstructed?

Property No.	Mechanism of Reconstruction		***Level of Self- Involvement
	Role of NGO*	Role of Gov**	
1.			
2.			
3.			

*NGO:

- 1: Full reconstruction
- 2: Financial assistance
- 3: Assistance in the form of materials
- 4: Technical assistance

**Gov:

- 1: Compensation for full construction
- 2: Material on subsidised rate
- 3: Technical assistance

***Level of Self-Involvement:

- 1: Nil
- 2: Employed hired labour
- 3: Contributed as unskilled labour
- 4: Contributed as skilled labour

VII. SATISFACTION ABOUT HOUSES – RECONSTRUCTED BY GOVT. COMPENSATION:

7.1 Please give the details about your satisfaction in relation to the following (Please tick):

Sr. No.	Features	Satisfied	Not satisfied	N.A.
1.	Location of the house			
2.	Size of the homestead plot			
3.	Size of the house			
4.	Quality of materials			
5.	Quality of construction			

7.2 Are you satisfied with the house(s) you have reconstructed with government compensation? YES/NO _____

7.3 What are the **POSITIVE FEATURES** of your present house when compared to your original house before the earthquake?

7.4 What are the **NEGATIVE FEATURES** of your present house when compared to your original house before the earthquake?

7.5 Did you make any modifications to the house? YES/NO _____

If yes, give details:

Sr. No.	Feature	Addition Y/N	Type of const.	Was the feature present in earlier housing? Y/N
1.	<i>Chali</i>			
2.	Shelter for livestock			
3.	External kitchen			
4.	Compound Wall/Veranda			

7.6 Did you undertake any repair work due to poor quality of construction? YES/NO

If yes, give the details:

Sr. No.	Item	Time of Repair after Possession	Total Expenses
1.			
2.			
3.			
4.			

7.7 Is there any amenity in the house that is provided and not used by you?

Sr. No.	Item	Usefulness	Explain
1.	Toilet		
2.	Bathroom		
3.	Roof Water Harvesting		
4.	Tank		
5.	Hand pump		
6.	Others		

(1: Very Useful, 2: Somewhat useful, 3: Not of much use, 4: Inconvenient)

7.8 How good was the technical advice provided by the government?

a) Insufficient _____ b) sufficient _____

7.9 How good was the quality of the materials supplied by the government?

a) Good _____ b) poor _____

VII. SATISFACTION WITH HOUSES – RECONSTRUCTED BY NGOS OR WITH NGO SUPPORT

8.1 Please give the details about your satisfaction in relation to the following (Please tick):

Sr. No.	Features	Satisfied	Not satisfied	N.A.
1.	Location of the house			
2.	Size of the homestead plot			
3.	Size of the house			
4.	No. of rooms			
5.	Quality of materials			
6.	Quality of construction			

8.2 Are you satisfied with the house(s) you have received from NGO or reconstructed with NGO support? YES/NO _____

8.3 What are the **POSITIVE FEATURES** of your present house when compared to your original house before the earthquake?

8.4 What are the **NEGATIVE FEATURES** of your present house when compared to your original house before the earthquake?

8.5 Did you make any modifications to the house? YES/NO _____

If yes, give details:

Sr. No.	Feature	Addition Y/N	Type of const.	Was the feature present in earlier housing? Y/N
1.	Chali			
2.	Shelter for livestock			
3.	External kitchen			
4.	Compound Wall/Varanda			
6.	Others			

8.6 Did you undertake any repair work due to poor quality of construction? YES/NO _____

If yes, give the details:

Sr. No.	Item	Time of Repair after Possession	Total Expenses
1.			
2.			
3.			
4.			

8.7 Is there any amenity in the house that is provided by the NGO that was not there in your old house?

If so give details:

Sr. No.	Item	Usefulness	Explain
1.	Toilet		
2.	Bathroom		
3.	Roof Water Harvesting		
4.	Tank		
5.	Hand pump		
6.	Others		

(1: Very Useful, 2: Somewhat useful, 3: Not of much use, 4: Disturbing)

- 8.8 How good was the technical advice provided by the NGO? a) Insufficient _____ b) sufficient _____
 8.9 How good was the quality of the materials supplied by the NGO? a) good _____ b) poor _____

IX. OVERALL SATISFACTION WITH POST-EARTHQUAKE REHABILITATION AID

- 9.1 If you received a house from an NGO, did you have to renounce to government compensation? YES/NO _____
 9.2 If you had known the type of house you would receive from the NGO, would you still go for this option or would you have preferred government compensation?
 a) I am satisfied with the NGO house _____ b) I would have preferred Government compensation _____
 9.3 Do you know the financial value of the house you received? YES/NO _____ If NO go to 9.5
 9.3.1. If you had a choice, would you have preferred to get the money instead of the house? YES/NO _____
 9.3.2. If you had received the equivalent money would you have been able to:
 a) Construct a better quality house. _____
 b) Construct the same quality house. _____
 c) Would not have been able to match the quality of the given house. _____
 9.4 If you reconstructed a house with government compensation as well as got one from NGO, which of the two do you like more?
 a) Government house _____ b) NGO house _____
 9.5 Are you satisfied with the overall quality of housing of **YOUR OWN** house? YES/NO _____
 If NO please ask the following questions:
 9.5.1 Are you satisfied with the quality of design? YES/NO _____
 If no, state how it can be improved: _____
 9.5.2 Are you satisfied with the quality of construction? YES/NO _____
 If no, state how it can be improved: _____
 9.8 Are you satisfied with over all effectiveness of rehabilitation of social infrastructure? YES/NO _____
 If NO, please suggest measures that could have made it more effective? _____

X. PRESENT HOUSEHOLD SITUATION

10.1 At present what is your household’s overall situation compared with before the earthquake?

	Better	Same	Worse	Don’t know
Economic				
Health				
Education				
Housing				
Village environment				
Community life				

XI COMMENTS AND OBSERVATIONS:

DO YOU HAVE ANY COMMENTS OR REMARKS YOU WOULD LIKE TO ADD?

11.2 OBSERVATIONS OF THE SURVEYOR _____

SURVEYOR’S SIGNATURE: _____ **SUPERVISOR’S CHECK:** _____

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Notes

- 1 P. Oliver, *Dwellings: The House Across the World* (Oxford: Phaedon Press, 1987), p. 15.
- 2 See, for example, Sultan Barakat, *Housing Reconstruction after Conflict and Disaster*, HPN Network Paper 43, 2003; John Twigg, 'Technology, Post-Disaster Housing Reconstruction and Livelihood Security', in *Technology for Sustainable Development*, DFID Infrastructure and Urban Development Department, 2002, <http://livelihoodtechnology.org>; David Peppiatt et al., *Cash Transfers in Emergencies: Evaluating Benefits and Assessing Risks*, HPN Network Paper 35, 2002; and Paul Harvey, *Cash and Vouchers in Emergencies*, HPG Discussion Paper, February 2005.
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- 11 Twigg, 'Technology, Post-Disaster Housing Reconstruction'.
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- 13 See T. E. Downing, *Mitigating Social Impoverishment When People Are Involuntarily Displaced*, 2003.
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- 19 Abhiyan, *Coming Together*.
- 20 *Ibid.*, p. 50.

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