A Comparative Analysis of Six Housing Reconstruction Approaches in Post-Earthquake Gujarat

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“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 expanded 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” (Oliver 1987: 15)
CONTENTS

1. Introduction 5
   1.1. Background and objectives 5
   1.2. Methodology 6

2. Post-earthquake housing reconstruction policies and practices in Gujarat 7

3. Case Studies 9
   3.1. Owner-driven reconstruction approach (ODRA) 9
   3.2. The provision of semi-permanent shelters (PSPS) 14
   3.3. The “subsidiary housing approach” (SHA) 16
   3.4. The “Participatory housing approach” (PHA) 18
   3.5. Contractor-driven village reconstruction in situ (CODIS) 23
   3.6. Contractor-driven village reconstruction ex nihilo (CODEN) 33

4. Analytical Summary and Conclusions 46

5. References 50
1. Introduction

1.1. Background and objectives

On January 26th 2001 Gujarat suffered a devastating earthquake of a magnitude of 6.9 on the Richter scale. About 20,000 people lost their lives, 167,000 were injured, and over one million were rendered homeless. Out of Gujarat’s 18,356 villages, 7,633 suffered some damage and 450 villages were flattened. 344,000 houses were completely destroyed and 888,000 reported damages (UNDP 2001; WB/ADB 2001).

The reconstruction of Gujarat involved a high number of national and international actors, such as the Government of Gujarat, bilateral and multilateral development agencies, other Indian State Governments, private corporations, as well as local, national and international NGOs. Their approaches towards reconstruction varied significantly to the extent that it may be argued that Gujarat became a sort of laboratory for testing various building practices, technologies, materials and housing designs.

The objective of this report is to analyze and trigger a discussion about the advantages and risks of different post-disaster reconstruction approaches. The report is based on the findings of a multi-disciplinary research project funded by Swiss Solidarity and the Swiss Agency for Development Cooperation on “The role of humanitarian aid in the restoration of livelihoods in post-earthquake Gujarat” 1. The research focused on five post-disaster NGO housing reconstruction projects that have been financially supported by Swiss Solidarity.

Our first observation was that the role of international humanitarian aid and NGOs needed to be put into a broader perspective. In fact, the majority (72%) of the earthquake-damaged villages have been reconstructed by the people themselves with financial and technical assistance from the Government of Gujarat (Abhiyan 2003). Even in villages that were reconstructed by NGOs or private corporations, a section of the population opted for the government approach. This is why, though it was not part of the original research design, we decided to include in our study also an analysis of the Government of Gujarat supported owner-driven approach.

This report is based on in-depth case studies in eight villages and rapid rural appraisals in twelve villages. The research was carried out in two distinct phases. During phase one we carried out detailed observations and photographic documentation of the village layouts, community infrastructure, the quality of constructions and the main design features of the houses. Focus groups with men and women were held at hamlet level. We further carried out semi-structured individual and group interviews with numerous key informants, such as formal and informal village and hamlet leaders, and with a sample of men and women belonging to different communities and occupational groups (see SUPSI et al 2004). During Phase II we carried out a household survey in six villages that were reconstructed with financial assistance from Swiss Solidarity. A total of 434 face-to-face interviews were conducted with a random sample of 15% of the village households. The main focus of the survey was on how people in these villages perceive their socio-economic condition four years after the earthquake, and on their level of satisfaction with their present housing situation. The survey analysis, which includes a significant volume of socio-economic data and of the villagers’ livelihood situation before and after the earthquake, is presented in a separate report (see Ecosmart 2005).

1 See: http://www.kfpe.ch/projects/suas/joshi.html
This report focuses on post-earthquake housing reconstruction by consolidating the qualitative and quantitative data collected within the framework of this project together with a review of secondary literature.

This study should not be understood as an evaluation of specific projects and related NGOs. Its objective is to raise awareness among the various actors involved in post-disaster housing reconstruction about the advantages and constraints of different housing reconstruction approaches. Based on these considerations the name of the villages and concerned NGOs covered by the study will be omitted.

1.2 Methodology

This research project was carried out in two distinct phases. The main objective of phase I was to capture individual and collective views about the impact of the earthquake and related endogenous and exogenous responses by means of qualitative research instruments: individual semi-structured interviews with key informants (e.g. sarpanch and failia leaders) and a stratified sample of men and women, focus groups, village walk-throughs, observation, participatory mapping of village and community infrastructure before and after the EQ, detailed participatory assessment of design, materials, and construction quality of houses, and other tools currently used in qualitative social research. A review of secondary literature was instrumental to contextualise and interpret our own findings.

Our aim was to find out how different categories of people themselves articulate their views and experiences, without imposing on them pre-defined research questions. As to ensure a comprehensive and comparable profile of each village we prepared and made use of a detailed checklist (see Annex 1).

According to the original research design we intended to focus on four sites only. In the field, however, it soon became clear that covering only a limited number of places would not allow us to fully capture local diversities and complexities and the broad spectrum of housing reconstruction approaches that were followed in post-earthquake rehabilitation. People themselves had a marked tendency to critically compare the rehabilitation process of their village with other nearby villages and to encourage us to visit other sites as well. Based on these considerations finally conducted in-depth case studies in eight villages and rapid rural appraisals in twelve villages.

The findings of phase I allowed us to design an empirically grounded questionnaire which we carried out during phase II (December 2004-February2005) reflecting the issues on the ground, based on people’s own perceptions and concerns. The household survey was carried out in six villages and covered a random sample of 15% of the households leading to a total of 434 face-to-face interviews.

Fieldwork involved an experienced multi-disciplinary team of researchers, namely:

- Dr. Jennifer Duyne Barenstein (SUPSI/University of Zurich), social anthropologist, specialised in social impact assessments;
- Dr. Vijay Joshi (Ecosmart), environmental engineer, specialised resettlement planning and livelihood restoration and environmental impact assessment
- Ms. Swati Shrinivas Shinde (Ecosmart), architect, specialised in planning and implementation of affordable mass housing;
- Mr. Shailesh Vyas (ACT), agricultural scientist specialised in agriculture and livestock-based livelihoods in arid and semi-arid areas;
- Dr. Yogesh Jadeja (ACT), geo-hydrologist, specialised in water resource management in arid and semi-arid areas.
2. Post-earthquake housing reconstruction policy and practices in Gujarat

Less than two weeks after the earthquake the State Government of Gujarat constituted the “Gujarat State Disaster Management Authority” (GSDMA), which announced its rehabilitation policy only a few days later. It proposed relocation of the most affected villages, assistance for in-situ reconstruction of severely affected villages, assistance in less damaged areas for repair and in-situ reconstruction; and assistance for modern buildings in urban areas\(^2\). The Government of Gujarat also invited national and international governmental, non-governmental and private sector organisations to ‘adopt’ villages and to take over their full reconstruction.

The policy was clearly based on the one followed by the Government of Maharashtra after the earthquake in 1993. However, whereas in Maharashtra eight years earlier there appeared to be a high societal consensus about relocation this was not the case in Gujarat, where the announced policy met with stiff public resistance. Prominent public figures, including the former Deputy Commissioner of Latur district, warned the Government of Gujarat from repeating the same mistakes (Pathak 2001). A systematic public consultation carried out by an NGO network in 480 villages revealed that over 90% of the Gujarati villagers refused the idea of relocation. For some time the State Government insisted on its approach, but when it became clear that relocation was not only opposed by professionals, civil society organisations, and the concerned villagers, but also unacceptable to the World Bank, it finally abandoned its relocation plans. The Government of Gujarat thus adopted an “owner-driven”

\(^2\) (cf: http://www.gsdma.org).
reconstruction approach, as opposed to the “contractor-driven” approach that was followed in Maharashtra. Its reconstruction policy consisted in offering financial and technical assistance to all those who preferred to undertake reconstruction on their own and did not want relocation and full scale ‘adoption’ by an external agency. Given the option, 72% of the villages decided to go for financial compensation and to reconstruct their houses on their own (Abhiyan 2003).

The government’s abandonment of the relocation-cum-adoption policy had a number of implications for NGOs, which at that time had already developed their adoption plans. Several local NGOs adapted to the new policy scenario and embraced self-help construction programmes and supported communities who opted for financial compensation through additional construction material, training and technical assistance. Many international NGOs and private corporations went ahead with the same village adoption-cum-contractor driven approach they had followed eight years earlier in Maharashtra.

Photo 2: Owner reconstructed house (a)
3. Case Studies

3.1 Owner-driven reconstruction

The owner-driven approach focuses on enabling communities to undertake the building work themselves. This is possible when labour is available, housing design is relatively simple, communities have a tradition of self-building and there are no strict time pressures (Barakat 2003:33).

Barakat’s extensive review of different post-disaster housing reconstruction approaches points at a number of advantages associated to this reconstruction approach. The most tangible benefits are that the costs tend to be lower, building may be incremental allowing occupancy already before the house is fully finished, and occupancy rates are generally higher. In addition a number of intangible benefits also need to be mentioned. Encouraging the active participation of the disaster-affected community, 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 number 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 preserve the local cultural heritage and vernacular housing style, which is instrumental for the preservation of 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 (Oliver 1987).

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. Further, people may be too busy in pursuing their livelihood activities to afford the time needed to participate or supervise construction works of their houses. Further, 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 technical assistance (Barakat 2003, Twigg 2002).

Experts in post-disaster housing reconstruction and international agencies are increasingly favourable towards owner-driven reconstruction. However, it never was adopted on such a large scale as in Gujarat after the 2001 earthquake.

As was mentioned earlier, the Government of Gujarat adopted an owner-driven approach as a response to citizens’ resistance towards relocation and state-driven top-down reconstruction. The owner-driven approach was also endorsed by the World Bank, whose strict safeguard policies on involuntary resettlement would not have allowed financing an approach with emphasis on relocation. At its early stage the experiment attracted the media and a number of scholars who were rather sceptical about the government’s intentions and about the viability of its reconstruction approach. The architect Rohit Jigyasu, for example, who was equally critical about the contractor-driven relocation approach followed in Maharashtra, expressed his concerns about the possible social implications of the Gujarat post-earthquake reconstruction policy (Jigyasu 2001a and 2001b).
Photo 4: Owner reconstructed house (b)

Photo 5: Owner reconstructed house (c)
Within the framework of this research project we conducted rapid rural appraisals in five villages that were fully reconstructed with financial and technical assistance from the government. In addition, in almost all villages reconstructed with the financial support of Swiss Solidarity some households opted for the government approach. Thus, besides semi-structured interviews and individual and group interviews with citizens who followed this approach, our survey covered 136 (31.3%) households who either reconstructed their only house with governmental financial support or who obtained assistance from the government as well as from an NGOs.

We found that the majority of the people were satisfied with the Government’s damage assessment and the financial support for self-reconstruction. The quality of construction in most cases was good. A high quality of construction could be achieved thanks to strict building codes and to good technical assistance and supervision. The disbursement modalities of the financial assistance further contributed to ensure good construction quality. In fact the money was released in three instalments and each further instalment would only be disbursed if progress in construction met specific quantitative and qualitative standards. No evidence was found to support the allegations of some NGOs and CSOs that the government discriminated ethnic and religious minorities. Though we visited several poor and remote communities, discrimination against minorities or socially disadvantaged groups was never mentioned, though across all communities some people mentioned that some “speed money” (around 5% of the financial compensation) had to be paid for a timely release of the funds. Our findings are consistent with those of a survey carried out by Abhiyan, which shows a high degree of satisfaction with the owner-driven approach in all regions and across all communities (Abhiyan 2003).

Table 1: Citizens’ satisfaction with owner-driven reconstruction (in %; N = 136)

<table>
<thead>
<tr>
<th>Satisfaction with…</th>
<th>Village 1 (PSPS)</th>
<th>Village 2 (SHA)</th>
<th>Village 3 (PHA)</th>
<th>Village 4 (CODIS)</th>
<th>Village 5 (CODEN)</th>
<th>Village 6 (CODEN)</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>House location</td>
<td>100</td>
<td>99</td>
<td>95</td>
<td>100</td>
<td>100</td>
<td>NA</td>
<td>99</td>
</tr>
<tr>
<td>House Size</td>
<td>83</td>
<td>86</td>
<td>95</td>
<td>96</td>
<td>100</td>
<td>NA</td>
<td>90</td>
</tr>
<tr>
<td>Quality of materials</td>
<td>100</td>
<td>92</td>
<td>95</td>
<td>96</td>
<td>100</td>
<td>NA</td>
<td>94</td>
</tr>
<tr>
<td>Construction quality</td>
<td>100</td>
<td>94</td>
<td>95</td>
<td>96</td>
<td>100</td>
<td>NA</td>
<td>95</td>
</tr>
<tr>
<td>Average</td>
<td>95.75</td>
<td>92.75</td>
<td>95.00</td>
<td>97.00</td>
<td>100</td>
<td>NA</td>
<td>94.50</td>
</tr>
</tbody>
</table>

Source: Household survey, December 2004-February 2005

The majority of the people who reconstructed their house under this approach employed construction materials with which they were already familiar, such as bricks, stones, and wood. Many people succeeded in rescuing some material from their old houses. Most houses were reconstructed in situ following vernacular designs and spatial arrangements, so that the villages reconstructed with Government financial assistance maintained their traditional character. Some people however also introduced innovations, such as flat roofs reflecting the changing tastes and preferences and a selective adoption of new designs, building technologies and construction materials. Such diversity did not only reflect variations in local values and aesthetics, but also variations in housing requirements. Indeed, there is a clear link
between dwelling requirements and household’s livelihood strategies such as farming, animal husbandry and traditional cottage industries.

What is most important however is that the majority of the people who opted for self-reconstruction were highly satisfied with all major features of their present houses. This is shown in Table 1, which indicates that in average 94.5% of the households who pursued this approach were fully satisfied.

Nevertheless, our observations and open-ended interviews also pointed at some risks and limitations of the owner-driven approach as implemented by the Government of Gujarat.

A first contentious issue is that the Government of Gujarat, though it established a minimum as well as a maximum of financial entitlement, compensated people on the basis of what they had lost and not on what they needed. After the earthquake there were lively debates between the government, civil society organisations and international organisations, about whether the government should adopt a compensation policy (i.e. an insurance approach by compensating people in proportion to their losses) or a supportive role (i.e. assist people in relation to their own economic capacity) (Iyengar 2004). This debate reflects the growing recognition that better-off households in case of disasters face higher losses 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 which often lead to an irreversible impoverishment of poorer households (cf. Collinson 2002; Skoufias 2003). On this issue the government did not give in to the pressure of NGOs and civil society organisations. It nevertheless abandoned its first policy proposal that would have assisted rural households in proportion of the amount of land owned. The amount of financial support for housing reconstruction was thus defined by the value of the original house and the damage incurred. Nevertheless, it should be mentioned that though the Government with its financial compensation policy, may have perpetuated pre-existing socio-economic inequalities it did not contribute to reinforce them. Our survey data indicate 55.2% of the people consider their overall economic situation the same as before
the quake and 19.7% even better. The reason for 22.6% of the people to consider their economic situation worse is not related to the earthquake but to unsolved ‘development’ problems, primarily related to the degradation of land and water resources.

Table 2: Positive and negative features mentioned by households with houses reconstructed under the owner-driven approach (in %; N= 136)

<table>
<thead>
<tr>
<th>Positive Features</th>
<th>Village 1 (PSPS)</th>
<th>Village 2 (SHA)</th>
<th>Village 3 (PHA)</th>
<th>Village 4 (CODIS)</th>
<th>Village 5 (CODEN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earthquake resistant housing</td>
<td>78</td>
<td>90</td>
<td>100</td>
<td>67</td>
<td>71</td>
</tr>
<tr>
<td>House is commensurate to rural lifestyle</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Availability of storage space</td>
<td>5</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Future upgrading is feasible</td>
<td>5</td>
<td></td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plastering is provided</td>
<td></td>
<td></td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wooden doors and windows are provided</td>
<td></td>
<td></td>
<td></td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Flat Slab Roof is provided</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Features</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No negative feature</td>
<td>56</td>
<td>52</td>
<td>40</td>
<td>57</td>
<td>57</td>
</tr>
<tr>
<td>No compound wall</td>
<td></td>
<td></td>
<td></td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>External kitchen not provided or are less in area</td>
<td>8</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cracks are observed in the house</td>
<td>5</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inadequate storage space</td>
<td>19</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leakage in roof and walls</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>House does not have Chali</td>
<td></td>
<td></td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No colour-wash is provided</td>
<td>17</td>
<td></td>
<td>14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Household survey, December 2004-February 2005

Another problem with the government compensation policy, is that numerous poor households did not have their houses formally registered. These households were not entitled to any financial compensation. In general it may be said that the Government did not pay attention to the special needs of particularly vulnerable individuals (e.g. elderly people, female headed households) or groups (e.g. disadvantaged communities such as Kolis) who may not have the capacity to build themselves or to manage and supervise the building process. One of the villages in which we conducted a rapid rural appraisal provided a good example for the potential consequences of a mass approach. The village was inhabited by a rather poor community, who never before had the resources to construct high quality dwellings and hence lacked construction experience. Out of 19 households nine gave the mandate to build their houses to a local contractor, who did a very poor quality work. As they were not able with their first instalment to meet the benchmark set by the government, they
never got the second and third instalment. As a consequence their present housing situation is very poor. Though these observations could be made in only one community they point at a potentially serious problem. The subsidiary approach described in section 3.3 may be a viable strategy to overcome these type of limitations.

3.2 The provision of semi-permanent shelters

This approach is not comparable with the other housing reconstruction approaches but nevertheless merits attention. Post-disaster housing literature is relatively critical towards the provision of temporary shelters and points at many potential disadvantages (Oliver 1987, Barakat 2003, Twigg 2002). Temporary shelters are often made of imported materials, which are not adapted to the specific climate or culture of local communities. The provision of temporary shelters may alleviate the immediate need for accommodation and hence contribute to delays with the reconstruction of permanent housing. Sometimes the cost of temporary shelters may come close to the cost of reconstructing permanent houses and they reduce the funds available for permanent solutions.

Photo 7: Upgraded semi-permanent shelter
Photo 8: Owner reconstructed house in PSPS village (a)

Photo 9: Owner reconstructed house in PSPS village (b)
On the other hand it should be mentioned that there are situations in which temporary shelters or semi-permanent shelters constitute a necessity. This is the case for example when legal aspect related to land rights, or disagreement between the government and civil society on reconstruction policies may cause delays.

Swiss Solidarity provided financial support to two NGOs who engaged in the provision of semi-permanent shelters. Our research covered one village that has benefited from this type of assistance, which pointed at a number of potential benefits of semi-permanent shelters.

After the earthquake many NGOs and private companies tried to persuade villages about their adoption schemes by promising them readymade houses. The semi-permanent shelters gave people time to overcome their traumas and to study more carefully the various offers and options and to be in a better bargaining position vis-à-vis various organisations that approached them. In case of the village included in our study the majority of the villagers turned down the various NGO offers and eventually opted for Government financial support.

As the shelters were constructed with locally available materials (bricks wood and tiles, once their owners came to a permanent housing solution, they could either use the material for the construction of their new houses, convert them into a kitchen, a storage room, or up-grade them into an additional habitable room.

Our case study showed that what justified a relatively high investment in semi-permanent shelters was a fairly complex and dynamic policy context that put lots of pressure on people to make decisions about divergent reconstruction approaches with long-term consequences on their wellbeing. Without an acceptable temporary accommodation they may have accepted some reconstruction offer which may not have responded to their long-term requirements. What made semi-permanent shelters a viable investment in the case of the projects supported by Swiss Solidarity was the emphasis on in situ construction and the use of local materials and building techniques. Accordingly, their owners could later upgrade these dwellings by themselves or recycle the construction material.

3.3 The “subsidiary” housing approach

By ‘subsidiary approach’ we refer to the approach adopted by a number of local NGOs supported by Swiss Solidarity (through a Swiss NGO), which instead of engaging in housing reconstruction supported local communities in reconstruction through some additional construction material and technical assistance on top of the financial assistance obtained by the government. The construction material distributed by the NGO had a total value of 25,000 Rs.

The case thus basically constitutes an example of owner-driven reconstruction, which differs from the case described above to the extent that the NGOs target group benefited from some additional assistance. It may be argued that such assistance leads to over-compensation, in particular because the NGO did not enter into memorandum of agreement with the Government and hence people received full government compensation plus valuable construction material.

However, it should be mentioned that the communities in which these NGOs are working are 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 scheduled tribes of Gujarat. Most are engaged in seasonal migration finding employment either in the production of coal or salt. Their housing condition prior to the earthquake was very poor. About 22% of the households in these hamlets would not have been entitled to any compensation at all, for their houses
were not registered. In these cases the NGOs provided for full houses through the adoption of a participatory building approach. With the financial compensation they received from the Government plus the NGO’s material support many succeed in constructing two houses with the result that at present in these hamlets there are about 94% more houses than before the earthquake (see Table 11).

Table 3: Satisfaction with present housing situation in villages reconstructed through a subsidiary approach (N = 26)

<table>
<thead>
<tr>
<th>Satisfaction with…</th>
<th>Subsidiary approach (N = 21)</th>
<th>Full NGO reconstruction (N = 6)</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>House location</td>
<td>20 95</td>
<td>5 83</td>
<td>89</td>
</tr>
<tr>
<td>House Size</td>
<td>20 95</td>
<td>4 67</td>
<td>81</td>
</tr>
<tr>
<td>Quality of materials</td>
<td>20 95</td>
<td>6 100</td>
<td>97.5</td>
</tr>
<tr>
<td>Construction quality</td>
<td>20 95</td>
<td>6 100</td>
<td>97.5</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>20 95.00</strong></td>
<td><strong>5.25 97.00</strong></td>
<td><strong>91.25</strong></td>
</tr>
</tbody>
</table>

Source: Household survey, January-February 2005
It is therefore not surprising that their level of satisfaction with their present housing situation is very high and that 100% of the households consider their present housing situation better than prior to the earthquake. As indicated in Table 3, satisfaction with reference to specific variables was high in both cases but significantly higher under the subsidiary approach with regard to the size and location of the house. This indicates that the NGO performed better in its subsidiary role, (provision of construction materials) than when it assumed a leading role in construction.

The subsidiary approach was adopted by local NGOs with the argument that the role of NGOs is not to replace the government but to support people to obtain goods and services to which they are entitled, and to step in with some additional assistance only where formal entitlements are not sufficient. Based on these considerations they focused on poor and neglected communities scattered in small hamlets in fairly remote areas. As indicated by the figures above, the subsidiary approach led to a high level of satisfaction. In these hamlets 100% of the households consider their present housing better than before the earthquake.

Table 4: Positive and negative features mentioned by house owners in NGO-reconstructed SHA village (in %; N=26)

<table>
<thead>
<tr>
<th>Positive feature</th>
<th>Negative feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earthquake resistant house</td>
<td>No compound wall</td>
</tr>
<tr>
<td>Flat slab</td>
<td>Insufficient storage space</td>
</tr>
<tr>
<td>Plywood heat isolation on the ceiling</td>
<td>Small size</td>
</tr>
<tr>
<td>Wooden doors and windows</td>
<td>Poor quality of flooring</td>
</tr>
<tr>
<td>Households reported positive features</td>
<td>Households reporting negative features</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>126</td>
</tr>
<tr>
<td></td>
<td>92</td>
</tr>
</tbody>
</table>

Source: Household survey, December 2004-February 2005

3.4 The ‘participatory housing’ approach

By participatory housing we refer to an approach in which the NGO, though assuming a leading role in housing reconstruction, does not engage a professional contractor and gives major emphasis to the involvement of the house owners in reconstruction.

The participatory housing approach was adopted by one Swiss Solidarity-supported NGO, which entered into a partnership with a well-known Indian NGO. The NGO did not have any housing reconstruction experience prior to the earthquake but in its aftermath founded a semi-autonomous Housing Trust. The objective of the Housing Trust was to promote the use of ecologically sound and appropriate building technologies and materials, such as stone and brick masonry, and to train local people, particularly women, in seismically safe construction techniques. To this aim the Trust appointed highly competent professionals, including a Gujarati architect known for his commitment to environmental friendly low-cost appropriate technologies. The housing trust thus developed a reconstruction package, including the design of the houses, the construction materials, and training modules for local masons. The design of the house was finalized in consultation with community along with the choice of construction materials. The NGO houses are reconstructed *in situ*. They were equipped with single pit pour-flush sanitary latrines and a roof rainwater harvesting system including an
underground water tank with a capacity of 5000 l. Their total cost of 47,000 Rs was only 15% higher than the minimum financial compensation offered by the government. The NGO employed and trained local masons for construction and at least one family member had to participate with his or her own free labour.

Besides housing the NGO also engaged in the revival and restoration of community infrastructure such as check-dams, ponds and wells, and in the construction of community development centres. It further offered training to local men and women in masonry and further enhanced its pre-quake poverty alleviation programmes.

The NGO offered housing reconstruction assistance only to villages in which it was active already prior to the earthquake with community development and poverty alleviations programmes. However, it did not fully adopt these villages but offered housing to those who were in need and who preferred the NGO’s approach to governmental financial compensation. Their package was particularly attractive for poorer people who were entitled to relatively low financial compensation and who feared that the government would not maintain its compensation promises.

Swiss Solidarity, through its affiliated Swiss NGO, supported the participatory housing approach in three villages of which one village was covered by this study. In this poor and remote village counting nearly 500 households the NGO was active, with focus on women empowerment and micro-credit for the promotion of income generating activities, since eight years prior to the earthquake. No people had died in the earthquake in this village, but most mud-built houses collapsed.
Photo 12: PHA house model

Photo 13: PHA house (b)
The NGO constructed a total of 457 houses, meaning that over 90% of the village households got a house under the participatory housing approach. The houses reconstructed were of good quality and well integrated in the village territory. Care was taken of details such as isolation against the heat and mosquitoes screening. The NGO houses were constructed in situ, side-by-side to the owner-reconstructed houses from which they could hardly be distinguished if it was not for the roof rainwater harvesting system. All completed houses appeared to be inhabited and people in this poor village expressed a high level of satisfaction with 91% of the households judging their housing situation better than before the earthquake.

As was mentioned earlier the participatory approach gave much emphasis to training local people in masonry. This was appreciated, as the demand for skilled construction labour grew significantly after the earthquake and hence contributed to improve of their employment opportunities.

Some of the innovative features of the NGO houses were very appreciated. Sanitary latrines, which hardly anybody enjoyed before the quake and which require a significant behavioural change were considered ‘very useful’ by 59% of the house owners and considered of not much use by only 17%. Such high acceptance of sanitary latrines could be achieved thanks to the NGOs emphasis on raising awareness on hygiene and sanitation. Another feature that was highly appreciated by 97% the households to whom this amenity was provided (80% of the surveyed households), was the underground tank. The tank was considered important because the local supply of domestic water was very irregular and if and when water came to the village by tankers or through the regional water supply system they tried to get as much water as possible. Also in this case people, thanks to good NGO-provided training, they were aware that it needed to be thoroughly disinfected on a regular basis. A somewhat less appreciated feature was the roof rainwater harvesting structure, which is not surprising in an area where arid climate with rainfall of less than 300 mm a year concentrated in a short period. Only 2% of the households found this amenity very useful. An equal percentage found it of no use at
all, whereas 94% found it only ‘somewhat useful’. The minor importance attributed to this facility in solving the households’ domestic water supply problem was also reflected in the fact that none of the owner-driven houses added this innovative amenity to their own houses, not even when it was contiguous to the NGO house to which it could have easily be connected. Another amenity that was not considered useful was the hand-pump that was installed to lift the water from the tank as people found it more practical to lift the water with a bucket. This amenity was added to prevent the risk of contaminating the water stored in the tank. But given the fact that people would in any case not use this water for drinking but only for domestic uses, the risk of contamination was not considered an issue.

Table 5: Satisfaction with present housing situation in villages assisted through participatory housing approach (N = 65)

<table>
<thead>
<tr>
<th>Satisfaction with…</th>
<th>PHA (N = 54)</th>
<th>ODR (N = 25)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>House location</td>
<td>52</td>
<td>96</td>
</tr>
<tr>
<td>House Size</td>
<td>46</td>
<td>85</td>
</tr>
<tr>
<td>Quality of materials</td>
<td>50</td>
<td>93</td>
</tr>
<tr>
<td>Construction quality</td>
<td>50</td>
<td>93</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>49.5</strong></td>
<td><strong>91.75</strong></td>
</tr>
</tbody>
</table>

*Source: Household survey, December 2004-February 2005*

Note: Among the survey households, only 14 (21%) admitted having received financial compensation from the government as well as a NGO house. According to our observations and informal individual and group interview, the percentage of owner-reconstructed houses with financial compensation from the government is significantly higher.

Another achievement of the NGO which pursued a participatory housing approach, was its successful in mobilising the villagers in participating through voluntary labour in the restoration of village ponds and dams which considerably improved the village’s precarious water supply situation.

Nevertheless, as may be noticed from table 3, in spite of the NGOs grounded contextual knowledge, its long-term local community development activities, and its participatory approach, though it achieved a very high overall satisfaction with its housing programme, it could not match people’s satisfaction with the owner-driven approach, confirming a pattern that could be found in all villages.
<table>
<thead>
<tr>
<th>Positive feature</th>
<th>Negative feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earthquake resistant house</td>
<td>No compound wall</td>
</tr>
<tr>
<td>Kitchen is provided outside</td>
<td>Insufficient storage space</td>
</tr>
<tr>
<td>Plywood heat isolation on the ceiling</td>
<td>Small size</td>
</tr>
<tr>
<td>Wooden doors and windows</td>
<td>Poor quality of flooring</td>
</tr>
<tr>
<td><strong>households reporting positive features</strong></td>
<td><strong>households reporting negative features</strong></td>
</tr>
<tr>
<td>126</td>
<td>92</td>
</tr>
</tbody>
</table>

*Source: Household survey, December 2004-February 2005*

### 3.5 Contractor-driven village reconstruction *in situ*

Under the contractor-driven approach the task of housing reconstruction is given to a professional construction company whereby housing design, construction materials and expertise are often imported from outside the target community. The contractor-driven approach is generally chosen because it is considered the easiest and quickest way to provide housing and re-establish normality after a disaster (Twigg 2002).

The advantage of using construction companies are that large numbers of houses with standard specifications can be constructed relatively quickly using staff with technical expertise and specialist skills. It may be the best solution in contexts where the knowledge of construction is limited to professionals and there is no longer a tradition of community self-building. However, across the world only a fraction of houses are built with formal professional involvement. According to Oliver (1987:8) about 95% of the world human dwellings are built by the people themselves, without any professional support.

There is an increasing awareness about the drawbacks of employing contractors in post-disaster housing reconstruction. As pointed out by Barakat (2003:31), 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. The drawbacks of this approach may also be understood by going through the advantages of the owner-driven approach (see section 3.1).

In Gujarat the contractor-driven approach was commonly adopted by large national or international NGOs and private corporations. Swiss Solidarity funded two variations of the contractor-driven approach. In this section we discuss, the variation which focused on village reconstruction *in situ*.

The contractor-driven approach *in situ* was adopted by a large national NGO to which we will refer to as CODIS (CONtractor-Driven Approach In Situ). Thanks to substantive international financing CODIS could take over in Kutch full adoption and reconstruction of eleven villages encompassing a total of 3000 houses. Swiss Solidarity financed the construction of 535 houses, all located in an easily accessible village at around 30 Km from Bhuj.
CODIS proposed to reconstruct flat-roofed RCC houses of three different sizes, depending on the size of the plot. The smallest house had a size of 270 sqft and was estimated to cost around 85,000 Rs. For each house size it proposed three to four slightly different designs, giving people the option to choose, for example, between a veranda and an additional room. Villagers had an opportunity to see the proposed houses through models that were set up in the school and to give their feedback before the design was finalised. This led for example to abandoning the idea of constructing sanitary latrines inside the house. CODIS also encouraged the use of old doors, window shutters and frames that survived the earthquake to reduce costs and to make a fusions between old and new elements, with the awareness that such traditional items would contribute to turning the dwelling into a home.

CODIS thus showed concern to inform people, involve them in the finalisation of the design and to offer them different options and sensitivity towards local housing culture. Hence, CODIS’s sincere commitment and its good rapport with the local community led people to an overall high level of satisfaction in spite their critical views and on some issues (see below). As shown in Table 7, most people were satisfied with the location and size of the house. Several house owners in particular among the Harijans liked the fact that the house had upgrading potential. The flat roof was an innovative feature that was appreciated for it allowed to store or dry items on the roof. Some people mentioned that it may allow them to add an additional floor in the future. Satisfaction was lower with regard to the quality of materials, an issue that will be discussed further below.
Table 7: Satisfaction with present housing situation in villages assisted through contractor-driven reconstruction in situ (N = 166)

<table>
<thead>
<tr>
<th>Satisfaction with…</th>
<th>CODIS</th>
<th>ODA</th>
</tr>
</thead>
<tbody>
<tr>
<td>House location</td>
<td>No 152</td>
<td>95 6</td>
</tr>
<tr>
<td>House Size</td>
<td>143</td>
<td>89 5</td>
</tr>
<tr>
<td>Quality of materials</td>
<td>102</td>
<td>64 6</td>
</tr>
<tr>
<td>Construction quality</td>
<td>111</td>
<td>69 6</td>
</tr>
<tr>
<td>Average</td>
<td>127</td>
<td>79.25 5.75</td>
</tr>
</tbody>
</table>

Source: Household survey, December 2004-February 2005

Nevertheless, there were some factors, to some extent inherent to the contractor-driven approach, which led to sub-optimal results in a number of domains:

a) Bias towards accessible and better-off communities

Contractors are reluctant to go for small and remote communities, which in general are poorer than well-accessible villages. Indeed, it was among the CODIS selection criteria that the distance to the village should not be too far from Bhuj and that it should count at least 100 households. In Gujarat villages with these characteristics are generally not among the poorest. The village reconstructed by CODIS, though socio-economically heterogeneous, with its good access to Bhuj and related non-farm employment opportunities, was better-off than the average village and certainly significantly wealthier than the villages assisted by the NGOs which pursued the ‘Subsidiary Housing Approach’ and the ‘Participatory Housing Approach’ (see section 3.3 and 3.4)3.

b) Bias towards compact settlements

Another CODIS selection criterion was that the village should not be too scattered. This because scattered construction is more complex to manage and would slow down the pace of implementation. The CODIS village inhabitants, however, used to live very scattered. About 70% of the village households lived most of the year in their wadis (farms) and only came to the village in relation to religious festivals, private ceremonies and marketing purposes. Many villagers would have preferred to get a house in their wadi, a preference that was not accepted by the NGO. The villagers thus ended up reconstructing their wadi houses themselves, which is one of the reasons for the low occupancy rate of the NGO houses, in particular in the neighbourhoods belonging to the Ahir (farming) community, which

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3 This statement is based on a comparative analysis of socio-economic and agro-ecological indicators such as caste composition, occupational structure, ownership of land, water situation and soil fertility (see Ecosmart 2005)
constitutes 45% of the village population. Further, as they renounced to government compensation in favour of CODIS housing they reconstructed those houses without external financial and technical assistance, which raises questions about the safety of the houses in which they really live.

![Photo 16: Upgraded CODIS house](image)

c) Difficulties in controlling contractors leading to poor construction quality

NGOs may sometime underestimate the challenge to control contractors. In case of CODIS this led to 36% of the house owners to be unsatisfied about the quality of the materials and 31% about the quality of construction. This figures contrast to the 100% satisfaction with materials and construction quality among those households in the same village who pursued an owner-driven approach (see Table 7). The NGO set-up a Village Committee to supervise the rehabilitation works and encouraged house owners to monitor the contractor. However, this turned out to be a difficult task. In spite of the fact that many people were not satisfied with the quality of construction and accused the contractor of selling the project’s cement on the black market, they could do little to prevent irregularities and poor work. As shown in table 8, this led 31% of house owners to complain about leakages from the roof\(^4\) and 26% to be dissatisfied with the quality of doors and windows\(^5\). The quality of construction was particularly poor with regard to the sanitary latrines with the result that 36% of the households did not consider them useful at all. The law acceptance of sanitary latrines was partly attributed to the lack of water but was also determined by the excessively small size of the septic tank. We also noticed that waterproof paint that was supposed to be applied to all

\(^4\) Water seepage was observed in the lintel band where bricks have been used. The reason of such seepage could be the faster deterioration of the poor quality bricks which showed clear signs of corrosion.

\(^5\) Though CODIS in its proposal mentioned and budgeted for wooden doors and windows the contractor ended up using plywood, a material which deteriorates very rapidly in under the climatic conditions prevailing in Kutch.
houses to walls and ceilings and for which CODIS obtained the necessary financial resources, in most cases has not been applied at all. According to our observations there was a discrepancy between what CODIS promised to do in its project proposal and what the contractor finally delivered. However, there was a strong contrast between the quality of construction of the inhabited houses (mainly belonging to the Harijan community) and those that are vacant. In fact, for Harijans the housing programme constituted an opportunity to enhance their living conditions and accordingly closely supervised the contractor. Even if participation in construction through family labour was not foreseen under this approach, they added with their own labour and material resources to make-up for the weaknesses of the contractor. This was not the case of better-off communities, who reconstructed their own houses in the village or in the wadi and were never present on the construction site. For this people the CODIS house constituted an additional resource that may perhaps be occupied sometime in the future, when grown-up sons will marry or the joint family splits into nuclear families. This led to a dramatic qualitative difference between houses and to many not fully completed houses.

Photo 17: Uncompleted unoccupied CODIS house

d) Incompatibility between reconstruction in situ and standard housing designs proposed by professional architects

The CODIS case revealed a certain incompatibility between a contractor-driven reconstruction approach with formally trained architects in charge of designing the houses and reconstruction in situ. In fact, the core of the old village used to be very clustered and compact and the original plots were too small even for the smallest houses (270 sqft) proposed by the NGO. As a result the houses were not reconstructed in situ. The Harijan community could solve this problem thanks to a charity organisation, which offered them a plot of land adjacent to the old village. Also the new Ahir colony is located on what used to be agricultural land and is at quite some distance from their old falia. The Ahirs collectively purchased the plot of land with their own resources. This aspect, as indicated by table 5, did
not lead to a tangible dissatisfaction with location. Many people, in particular Harijans, were highly satisfied with this solution as they now have bigger homestead plots and more space. It nevertheless led to a rather chaotic and somewhat ugly new settlement, an issue that will be further discussed below.

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

<table>
<thead>
<tr>
<th>Positive feature</th>
<th>%</th>
<th>Negative feature</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earthquake resistant house</td>
<td>78</td>
<td>External kitchen is not provided</td>
<td>31</td>
</tr>
<tr>
<td>Plastering is provided</td>
<td>9</td>
<td>Inadequate storage space</td>
<td>49</td>
</tr>
<tr>
<td>Flat roof</td>
<td>17</td>
<td>Leakage in roof and walls</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Poor quality doors and windows</td>
<td>26</td>
</tr>
<tr>
<td>House owners reporting positive</td>
<td>104</td>
<td>House owners reporting negative features</td>
<td>137</td>
</tr>
<tr>
<td>features</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Household survey, December 2004-February 2005

e) Neglect of issues related village lay-out and community spaces

The fact that the NGO intended to reconstruct houses in situ led to neglecting the need for a settlement plan. Indeed the whole design effort focused on the house and little attention was paid to rebuilding a village. This was particularly noticeable in relation to the NGO- constructed Community Development Hall, which was constructed on the village’s former ‘chowraha’ (plaza). The chowraha used to be the centre of the village, where people met for social, cultural and economic reasons. At its centre there was a simple structure consisting of a tiled roof sustained by wooden pillars placed on an elevated concrete base that provided shade to people who used to meet there. On one side there used to be a small house that served as storage room and where pilgrims, business people, or other travellers could stay over night. At the centre of the chowraha there was a chabutēra.6 Instead of rebuilding chowraha as demanded by the villagers, the NGO mandated the contractor to build a big ‘Community Development Hall’, which is hardly ever used7. The Community Development Hall is no substitute for the old communal space and is an impediment for people to reconstruct it themselves. Nowadays what used to be a lively village centre is a dead place. People these days meet under a tree in the yard of the village’s principal temple or under some temporary structures near the bus stand. People remember the chowraha with nostalgia and feel that their village no longer has a centre.

6 A chabutēra is a relatively large-sized bird house that can be found in almost every village in Gujarat. Most villagers daily offer some grains to the birds.

7 Our first meeting with the village leaders was organised in the community hall at 6 pm. The completely empty and visibly unused oversized room was so hot that it was impossible to stay inside. The meeting place was thus shifted to the house of a Gram Panchayat member.
Photo 18: Upgraded house in CODIS village (harijan *falia*)

Photo 19: Interior of CODIS house (harijan *falia*)
f) Insufficient contextual knowledge

CODIS had not been active in the village prior to the earthquake and basically intended to concentrate on its physical reconstruction. It thus only had limited knowledge on the village’s socio-economic and agro-ecological situation prior to the earthquake. According to the NGO selection criteria, the village should have a “livelihood potential”. It would be overly pessimistic to maintain that the village does not have any livelihood potential. However, due to a severe depletion of its natural resources caused by unsustainable farming practices, the village was undergoing a rapid transformation. In fact, the village used to be known until recently for its wealth and fertile lands, which have been brought under groundwater irrigation about 30 years ago. Over the last decade, however, soil fertility has started to decline as land and water turned saline. Much land can no longer be cultivated or its productivity has shrunken to less than half. This situation had a dramatic impact not only on farming households but also on the demand of agricultural labour and thus primarily affected the landless Harijan community. The problem is so severe that after the earthquake the Harijan community (28% of the village population) contemplated to emigrate collectively. The opportunity to get a new house and promises of livelihood support prevented them from going ahead with their plan. Meanwhile, however, they realised that the house did not come with any viable solution to their livelihood problem. Many young male from this village have recently started migrating in small groups to the Middle East. Such massive migration may be yet another factor contributing to the low occupancy rate of the CODIS houses. CODIS may have failed to capture the village’s specific livelihood constraints due to the fact that it was not present with any activity prior to the earthquake.
Photo 20: The CODIS Community Development Centre

Photo 21: Current meeting place in CODIS Village
This also led to a rather ineffective livelihood programme focusing on the promotion of tailoring and embroidery, which did not have any tangible impact as the market for related products is already saturated. Lack of knowledge about the severe water problem faced by this village also led to an ineffective high investment in the Water Supply System. CODIS financed the construction of an impressive underground tank with a storage capacity of 400,000 l connected to a 200,000 l overhead tank and a water distribution system with numerous water points all over the village. This could have been a valuable infrastructure if the village had access to a viable water source. However, it is located at the tail-end of a regional water supply system and water hardly ever makes it to the village. Most of the time people have to rely on water brought by tankers, a precarious and stressful situation in particular for women. With the same resources it may have been possible to rehabilitate and improve several ponds, which would have contributed to recharge the groundwater table and to finance some other initiatives to counteract to the rapid depletion of the village’s natural resources. The CODIS village was among the few ones in which a high percentage of households (52%) reported that their economic situation was worse than before earthquake. CODIS may not be hold responsible for this situation but if it had recognised the specific problems it may perhaps have given a different focus to its livelihood programme and proposed some more contextually adapted water and sanitation solutions.

Though the above points led to grumbling and were consistently mentioned in the context of focus groups and semi-structured interviews, the household survey indicates that with regard to housing, the only factor that led to tangible dissatisfaction was the quality of materials and the quality of construction, for which house owners blamed the contractor rather than the NGO. If dissatisfaction was not higher and if at present 74% of the village households consider their housing situation better than before the earthquake this may be attributed to the fact that at present the village counts 67% more houses than before the earthquake.
Moreover, villagers did not see the Project Documents and accordingly were not aware about the discrepancy between what CODIS was supposed to deliver and what they finally got.

Photo 23: Signs of water infiltration in CODIS house

Nevertheless, table 7 shows that also in this village the NGO could not meet with the high level of satisfaction of the few households who opted for the government supported owner-driven approach, among whom the overall level of satisfaction was over 95%.

### 3.6 Contractor-driven village reconstruction ex-nihilo

The Contractor-driven village reconstruction approach ex-nihilo (CODEN) varies from the approach described above to the extent that the full village is relocated and reconstructed on a new site. The advantage of this approach is that it does not require the removal of rubbles and that the reconstruction plan is not constrained by buildings that survived the earthquake. However, there is a growing awareness that resettlement constitutes a traumatic socio-cultural experience and may have a strong negative impacts on people’s livelihood (see Cernea and Guggenheim 1993). This has led agencies such as the World Bank to introduce strict safeguard policies to avoid unnecessary resettlement.

As was discussed in chapter 2, people in Kutch fiercely opposed resettlement, which led the government to abandon a reconstruction approach based on relocation. Many private corporations and large NGOs nevertheless stuck to this approach, also because it gave them more visibility and control.

The contractor-driven village reconstruction approach ex-nihilo was adopted by a large NGO (which we will name CODEN) for the reconstruction of numerous villages. Among them three full villages (719 houses plus community infrastructure) have been financed by Swiss Solidarity through an affiliated Swiss NGO.
CODEN is a large NGO with a close association to a construction company with whom it already reconstructed five villages (2000 houses and community infrastructure) after the 1993 earthquake in Maharashtra. The reconstruction approach that was pursued in that context is known among professionals and scholars for a number of problems and weaknesses. Nevertheless, though information about the long-term problems and negative impacts related to post-disaster housing reconstruction in Maharashtra are publicly available and CODEN should have aware of them through its first-hand experience, in Gujarat it adopted the same approach, characterised by the following features:

i) Relocation and full reconstruction of new villages:
CODEN reconstructed its villages on land that was either provided by the Government or which the community had purchased itself. Full village reconstruction included infrastructure such as roads, schools, a community hall, a water supply system and drainage canals. The same plan was used for all villages with the result that they all have exactly the appearance.

ii) house size on the basis of land-holdings:
CODEN adopted the reconstruction approach that was initially suggested by the Government not only with regard to relocation, but also with regard to the definition of the size of plots and houses to be constructed. Its reconstruction plans thus entailed three type of plots and houses:

- 100-150 m² plots and 30m² houses at a total cost of 97,500 Rs for 294 landless and marginal landholders;
- 250 m² plots and 40 m² houses of at a cost of 127,500 Rs for 215 households owning 1-4 ha of agricultural land;
- 400 m² plots and 40 m² houses of at a cost of 157,500 Rs. For 210 households owning more than 4 ha of agricultural land.

iii) ‘random’ distribution of completed houses:
Throughout the construction process people did not know which would be their future house. The houses were distributed randomly among the villagers upon completed construction with landholdings being the only formal criterion for housing allocation. CODEN did not foresee any participation of the future house owners in construction or in monitoring the contractor. The fact that houses were allocated to people only upon completion also prevented them from informal participation and from monitoring the construction of their own house.

iv) ‘urban-like’ housing designs and spatial plans:
The villages constructed by CODEN are almost identical. Their plan consists of wide streets forming a grid pattern and row housing of flat roofed RCC buildings. The larger plots with their respective bigger houses are located at one end of the village, the medium sized houses in the middle, and the smallest plots and houses at the other end of the village.

CODEN’s approach was not appreciated by the majority of the villagers and led to considerable social tensions and frustration. Such dissatisfaction is not only related to its physical reconstruction approach but to its attempts to trigger ‘development’ by imposing a new spatial and social organisation. The main problems associated to this approach are briefly summarised below:

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8 (see: Jigyasu 2001a, 2001b and 2002; Salazar 2002a and 2002b)
Photo 24: CODEN village

Photo 25: A lane in the old village
a) Unnecessary resettlement

As discussed earlier in Gujarat, and in particular in Kutch where there was a higher level of information and awareness, people massively opposed relocation, hence forcing the government to reconsider its initially announced post-earthquake reconstruction policy. As a result, in Kutch there has hardly been any reconstruction ex-nihilo. However, systematic village consultations did not take place in other districts such as for example Jamnagar (Iyengar 2004). As a result villagers may have been ill-prepared to oppose resettlement. People in the CODEN villages maintain that there has not been any community consultation about relocation and that they were not given any alternative. CODEN’s offer was attractive for their leaders and they had no choice but to follow their decision.

Relocation was most likely necessary only in one village, not because of the earthquake but because of the construction of a dam that seasonally inundated the old village. The Irrigation Department, which also provided the land for the new village site, was already attempting to persuade the villagers to relocate prior to the earthquake but was about to find an alternative solution (construction of a dyke around the village) due to the strong opposition to relocation and lack of funding for financing the resettlement. After the earthquake relocation was considered a more viable option as it was related to what appeared to be a good and resourceful reconstruction project. However, no consensus was found about the new village site. About 30 households of in this village demanded for houses in another location, nearer to their agricultural land, but they were told that if they wanted to get any assistance they had to move to the site proposed for reconstruction by CODEN. The 30 households finally built on their own a new hamlet in a location that was more compatible to their livelihood activities.

In another village it was argued that resettlement was necessary because the old village was placed on a seismically unsafe ground, an argument that was used to persuade villagers to
relocate but does not seem to be supported by any scientific assessment. The village was very ancient and known in the entire region for its wealth and beauty that was still recognisable from the few houses that have been repaired by their owners and by the buildings that survived the earthquake and later destruction related to the attempt to recover material.

Photo 27: “We do not want to leave our home and our ancestors’ village”

In the third village there appeared to be no justification and even less public support for relocation. Contrary to the case of the other two villages, land for the new village site was not provided by the government and people had to purchase a plot at their own expenses. Judging from its present appearance it may be concluded that the old village was not severely damaged. Many houses were repaired by their owners with a relatively small investment. In this village dissatisfaction and social tensions are particularly high for a number of reasons. First of all, even more than in the other two villages, people feel that relocation was not necessary; secondly as the majority of the households belong to the Kadiya caste (skilled masons) they are more sensitive towards poor construction quality and even more frustrated
towards having been excluded from building their own houses; thirdly, they feel that not only they gave up government compensation for a house considered by many uninhabitable, but also spent a significant amount of money for purchasing the land, a high expense borne by many people through loans from moneylenders at exorbitant rates of interest. In this village most people refuse to move to the new village\(^9\). They still live in their old village houses\(^{10}\) or returned there after some time\(^{11}\). Among the main reasons given are: low construction quality, the house and settlement do not conform to rural lifestyle, no privacy for women due to lack of compound walls; lack of space for cattle, fodder and agricultural implements, and no space for their own furniture in the new house. These are some of the reasons why at present about 80% houses in this village are currently empty.\(^{12}\)

\(b\) Bias in favour of better-off villages

Among the studied villages those reconstructed by CODEN were by far the wealthiest one. This was revealed by their access to fertile agricultural lands, irrigation and by a high percentage of large landowners. Villages with access to irrigation are generally in a better position than ‘dry’ villages, but are also socio-economically more heterogeneous. CODEN does not explicitly mention its selection criteria and it is therefore difficult to explain such bias. It may be related to the fact that Jamnagar, the district where all three villages were located, is all together wealthier than Kutch. A further reason may be that CODEN was not working in this region prior to the earthquake and that the adopted villages were selected in close consultation with the District Commissioner, who may have had his own criteria for distributing villages among NGOs in search of villages to reconstruct. One of the CODEN villages, the less severely damaged one, may have been offered by the DC for adoption due to a curious mistake\(^{13}\). In fact, two CODEN villages almost have the same name and can hardly be distinguished phonetically. When the District Commissioner was invited to the first village for the ‘adoption ceremony’ organised by CODEN, he erroneously went to the other village. He was received by an influential high-caste community member, who persuaded him to do something for his village as well. Soon after CODEN came forward offering to adopt the village. The informal village leader had the power to impose his will on the majority of the people who had already started to rebuild or repair their houses in the old village.

c) Bias in favour of economically better-off households

It was inherent to CODEN’s approach that better-off households would get larger plots and houses. The logic behind this differentiation was not mentioned in the project proposal. In discussions with CODEN staff they justified their approach by arguing that in a society characterised by strong inequalities it was not possible to treat all people as if they were

\(^{9}\) Refusing to move to the new village is not possible in the other two villages, where the land for the new village was donated by the government, at the condition that they would surrender property rights of their plots and houses in the old village.

\(^{10}\) Many of the houses visited in the old village were not much damaged and/or well repaired. Others, however, could not afford to retrofit their damaged houses adequately, because they had no government support and because they spent all their savings to purchase land in the new site.

\(^{11}\) About 40 households who had moved to the new village for some time meanwhile returned to the old village as they were not satisfied with their new houses and could not adjust to the new village atmosphere.

\(^{12}\) Another reason is that many houses belong to people who do not live and never lived in the village. In a face-face-interview a woman told that her family managed to get in the name of different relatives two houses in their own village and three houses in one of the other two CODEN villages. Some houses are already being sold. In one village we met an elderly couple living in Mumbai but still owning some land in the village, who purchased a CODEN medium-sized house for 35,000 Rs, i.e. at 92,500 Rs less than what Swiss Solidarity paid for it.

\(^{13}\) On this problematic approach see for example Pathak 2001.
equal. Literature on the Maharashtra 1993 earthquake housing reconstruction policy, from where the approach originates, provide a somewhat more logical explanation for this bias. In fact, at that time it was assumed that large landowners are by definition farmers who need more space than landless households for the animals and agricultural implements.

Photo 28: A family who refuses to move to the new CODEN village

Photo 28: A house in the old village
Photo 30: House gate in ‘upper class’ neighbourhood (CODEN village) (a)

Photo 31: House gate in ‘upper class’ neighbourhood (CODEN village) (b)
This argument does not hold on a number of grounds. First of all, livelihood strategies are increasingly diversified also in rural areas and large landlords are often not at all involved in agriculture, as they may rent out their lands to landless tenants. Secondly, many landless castes, such as weavers and carpenters exercise their occupations in the premises of their houses and accordingly may need more space than rich landlords.

Finally this approach tends to neglect the fact that rich households are endowed by financial and social capital that allow them to restore their livelihoods even without external aid. This is not the case of poor households for whom disasters often lead to impoverishment (Oliver-Smith 1990; Skoufias 2003)

d) Elite capture of decisions and project benefits

The risk of elite capture of community development projects is well-known and is particularly high in a socio-economically highly heterogeneous context. It can be mitigated by avoiding giving excessive decision-making power to self-appointed community representatives, through transparency, and through grass-root level participation (Duyne 2004; Platteau 2004).

CODEN claims that it conducted a systematic consultation with all communities in the three villages on critical issues such as relocation, village lay-out and housing design. This however was not the opinion of the villagers. The majority of the people felt that they had no say on the decision about whether they wanted their village to be adopted by CODEN to begin with and never were consulted on any issue later in the process either. People in all villages were very outspoken about the vested interests of the local elite and maintained that the most influential people got personal benefits from persuading people to accept CODEN adoption. The reason why the local elite was favourable to CODEN adoption was clearly related their personal advantages. This was not only asserted by less fortunate villagers, but also became evident from observing the luxurious residential areas that the village elites had created for themselves with NGO support.

In the CODEN villages we found that the local elite has been able to obtain more than one plot and house by registering them in the name of people who had no entitlements (minor aged children living with their parents or relatives who did not live in the village). We found for example two brothers living in a joint compound who told us that they had obtained a plot of 12,000 sqft and two additional houses in the name of their two brothers who lived in Ahmedabad. In the same neighbourhood we met with two women who told us that their husbands managed through the same strategy to obtain four houses and homestead plots of 10,500 sqft. A woman in the elite neighbourhood proudly told us that her family managed to acquire in the name of different family members three houses in their own village and an additional three houses in another CODEN village, where none of them was living. It was remarkable that people who acquired such a disproportional amount of benefits did not even appear to be embarrassed about it. Perhaps, given the fact that the size of homestead plots and houses was defined on the basis of agricultural landholdings and they all owned over 40 ha land, they felt that they were somehow entitled to such additional resources. This situation created strong resentment among those who did not have such influence and contacts. With bitterness a group of less fortunate women told us that “…they (the powerful elite) managed to get houses even in the name of four years old children!”

In one village the local elite also could chose for its own neighbourhood the best quality of land characterised by a high groundwater table. This allowed them to build their private wells. Also critical village infrastructure such as the Community Development Hall, the schools, the Office of the Gram Panchayat and the prestigious village gate were all located in the ‘rich’ neighbourhood. Their privileged economic situation and the huge size of their
homestead plots allowed them to make additional investments in their houses, such as nicely tiled toilets and bathrooms, beautifully finished compound walls, flowers and trees, luxurious gates, ‘offices’ to receive their guests, parking space for their cars, and sheds for their cattle. Prior to the earthquake the lifestyle of these people did not differ so dramatically from the one of other people, or at least not from the one of those belonging to their same caste. It is therefore not surprising that this situation led to big social tensions and frustration.

d) Interferences in local social organisation

Though the caste system is the most classical example of a highly stratified society, social injustice and inequality are not inherent to the caste system. Whereas inequality is a universal phenomenon, the caste system is somewhat unique to the Indian sub-continent. Castes are first and above all groups of people connected to each other through kinship and common ancestors. Each caste has its unique customs and beliefs, which finds expression, among others, in different housing styles and settlement patterns. Such variations are not only the expression of cultural diversity, but also reflect the needs of caste-specific occupations. Castes do not consist of socio-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 the obligation to provide patronage to the weaker ones. Therefore, families belonging to the same caste have a natural desire to live close together (see Dumont 1980, Bétaille 1983).
The project documents indicate that the NGO was aware of the importance of castes in rural India. CODEN appeared to attribute to the caste system all evils of Indian society, thereby underestimating the importance of economic inequality. By reorganising the village territory along 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 discuss whether a class society is more legitimate than a caste society. However, the attempt to introduce such dramatic social changes is unlikely to succeed, made people unhappy and certainly did not contribute to reduce their socio-economic vulnerability. Quite to the contrary, 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 to a large extent confined by the boundaries of their neighbourhood. The fact that the new settlement no longer allows people to live near their relatives and community members is among the factors that contributed to high resentment, to a mass refusal to occupy the new houses in one of the villages, and to the sale and exchange of houses.

e) Poor construction quality

Another tangible factor that led to high levels of dissatisfaction with CODEN was the poor quality of construction. As was discussed earlier high quality construction is difficult to achieve with RCC construction under the climatic conditions prevailing in Gujarat. In Gujarat water is a scarce resource which may be a serious impediment for appropriate RCC curing. If in addition to this problem the agency is in a hurry to complete construction as soon as possible, the quality of construction may indeed suffer significantly.

Table 9: Satisfaction with present housing situation in villages assisted through contractor-driven reconstruction ex-nihilo (N = 77)

<table>
<thead>
<tr>
<th>Satisfaction with…</th>
<th>Village A</th>
<th>Village B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CODEN (N = 20)</td>
<td>ODR (N = 7)</td>
</tr>
<tr>
<td>House location</td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>House Size</td>
<td>13</td>
<td>65</td>
</tr>
<tr>
<td>Quality of materials</td>
<td>7</td>
<td>35</td>
</tr>
<tr>
<td>Construction quality</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Average</td>
<td>7.75</td>
<td>40</td>
</tr>
</tbody>
</table>

Source: Household survey, January-February 2005

In CODEN villages dissatisfaction with the quality of materials and construction was very high. 61.5% of the house owners in the two villages surveyed were not satisfied with the
quality of the used materials. The level of dissatisfaction is even higher with the quality of construction: 96.5% of the households are in fact not satisfied with the quality of construction, mainly because of water infiltrations from the roofs and walls. These construction quality problems were confirmed by the research team’s observations. The level of dissatisfaction with the quality of the house led several people not to trust the safety of the house. Only in these villages, as shown in Table 10, we found a significant number of people being unable to mention any positive feature of their new house and a high percentage of households who explicitly said that it had no positive feature at all. The level of dissatisfaction with the NGO house stands in sharp contrast with the 100% satisfaction in all domains among those households who reconstructed their houses under the owner-driven approach.

As was mentioned in section 3.5 poor quality housing in contractor-driven reconstruction projects is sometime the result of NGOs’ inexperience to handle contractors who may have their vested interest to safe time and resources at the cost of construction quality. In this case the problem was exacerbated by a complete lack of accountability as the construction company had a close association with the NGO and was given the contract without going through any regular tendering procedure.

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

<table>
<thead>
<tr>
<th>Positive feature</th>
<th>V1</th>
<th>V2</th>
<th>Negative feature</th>
<th>V1</th>
<th>V2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earthquake resistant house</td>
<td>82</td>
<td>40</td>
<td>External kitchen is not provided</td>
<td>34</td>
<td>25</td>
</tr>
<tr>
<td>Plastering is provided</td>
<td>2</td>
<td>-</td>
<td>Leakage in roof and walls</td>
<td>76</td>
<td>60</td>
</tr>
<tr>
<td>Provision of toilet and bath</td>
<td>-</td>
<td>5</td>
<td>No compound wall</td>
<td>-</td>
<td>25</td>
</tr>
<tr>
<td>No positive feature</td>
<td>14</td>
<td>35</td>
<td>small size of rooms</td>
<td>16</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Not suitable to rural lifestyle</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Poor quality doors and windows</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Height of plinth is inadequate</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Households reporting positive features</td>
<td>84</td>
<td>45</td>
<td>Households reporting negative features</td>
<td>176</td>
<td>110</td>
</tr>
</tbody>
</table>

Source: Household survey, December 2004-February 2005

f) Low occupancy rates

Based on the above-mentioned problems it is no surprise that where people had an alternative they refused to move to their new houses. In the village with the highest level of dissatisfaction many people repaired or reconstructed their houses in the old village. This was possible because they had purchased themselves the land on which the new village was built. According to our estimate the occupancy rate in the new village did not exceed 20% of houses.

14 The survey could be carried only in two 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 household. He only allowed the team to speak with people of his choice and in his presence. Under such conditions we renounced to the endeavour.
The percentage of occupied houses was higher in the other two villages, where people obtained the land for building the new village from the government. This was linked to the condition that they would surrender their old property rights to the State. In these villages the reason why nevertheless many houses were empty was most likely to be attributed to the elite appropriation of more than one house.

Photo 33: Empty houses in CODEN village
5. Analytical summary 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.”

(Oliver 1987:11)

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 however also warns from some of the risks associated to this housing reconstruction approach, such as insufficient support to the most vulnerable community members. These risks, however, can be mitigated, and may constitute an important area of intervention for NGOs.

The study further confirms many of the drawbacks and risks associated with a contractor-driven approach: lack of flexibility, cultural insensitivity, low capacity to adapt to local conditions; a tendency to introduce exogenous construction materials that are inadequate under local climatic conditions and that are difficult for local communities to maintain and upgrade.

What is unique of this study, however, is that it focuses on people’s own view. Indeed, the above conclusions are not based on project evaluations by ‘experts’ but on a systematic empirical investigation that involved both qualitative and quantitative research methods. The study thus gave a voice to the concerned people themselves to express how they feel about different post-disaster housing reconstruction approaches. What emerges from our data with regard to people’s appreciation of different housing reconstruction approaches is a clear and coherent picture:

Across all villages covered by this study, the highest level of satisfaction could be achieved with what we named the “subsidiary housing approach”. As shown in Table 3 (page 17), with regard to all key variables related to housing, 95% of the households were fully satisfied. This approach constitutes a variation to the owner-driven approach to the extent that the house owner retains full responsibility and control over the reconstruction of his house but obtains from an NGO some additional material and financial support. The households that benefited from this assistance belonged to the poorest and most neglected communities of rural Gujarat and such additional assistance was certainly justified even if it led to something more than re-

15 Prof. Paul Oliver is the Head of the Department for Architecture at the Oxford Polytechnic.
establishing pre-disaster ‘normality’. In these villages 100% of the people felt that their housing situation is at present better than before the earthquake. In fact, as shown in Table 12 the combined support of the Government and the NGO allowed many people to build more than one house with the result that at present there are 94% more houses than before the earthquake.

The “subsidiary housing approach” thus proved to be the most effective way to mitigate some of the risks of the owner-driven approach and may even lead to an improvement of housing situation in comparison with the pre-disaster situation. Under the subsidiary approach the NGO does not aim at competing or replacing the role of the state but at complementing it by providing support to the most vulnerable to obtain goods and services to which they are entitled. It requires from NGOs’ side a commitment to look for the most vulnerable people or communities, and focus on people whose official compensation entitlements are not insufficient to meet specific standards. Such an approach may somewhat change the balance between capital investments and investments in human resources for it means supporting rather small and scattered projects. It thus requires funding agencies to encourage smaller projects with a somewhat higher proportion of personnel costs.

<table>
<thead>
<tr>
<th>NGO support per housing unit (in Rs)</th>
<th>ODA</th>
<th>SHA</th>
<th>PHA</th>
<th>CODIS</th>
<th>CODEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.A</td>
<td>25,000</td>
<td>47,000</td>
<td>85,000</td>
<td>123,995</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Satisfaction with…</th>
<th>ODA</th>
<th>SHA</th>
<th>PHA</th>
<th>CODIS</th>
<th>CODEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>House location</td>
<td>99</td>
<td>95</td>
<td>96</td>
<td>95</td>
<td>64.5</td>
</tr>
<tr>
<td>House Size</td>
<td>90</td>
<td>95</td>
<td>85</td>
<td>89</td>
<td>51</td>
</tr>
<tr>
<td>Quality of materials</td>
<td>94</td>
<td>95</td>
<td>93</td>
<td>64</td>
<td>38.5</td>
</tr>
<tr>
<td>Construction quality</td>
<td>95</td>
<td>95</td>
<td>93</td>
<td>69</td>
<td>3.5</td>
</tr>
<tr>
<td>Average</td>
<td>94.50</td>
<td>95.00</td>
<td>91.75</td>
<td>79.25</td>
<td>39.37</td>
</tr>
</tbody>
</table>

Source: Household survey, December 2004-February 2005

Citizens’ appreciation for the owner-driven approach (ODA) almost matches satisfaction with subsidiary housing approach. The data are based on structured interviews with a sample of 136 people across five different villages in Kutch, Patan and Jamnagar District, thus confirming a pattern across the whole area affected by the earthquake. In all these villages NGOs had been active in housing reconstruction. Citizens thus had the opportunity to compare the advantages and drawbacks of the two different approaches and to build their opinion on the basis of comparison. Their high level of satisfaction thus expresses not only an absolute preference for an owner-driven approach but also a relative one. The owner-driven approach is most empowering and participatory and thus should be appreciated by NGOs, which consider community empowerment and participation among their main objectives. Many NGOs, however, show reluctance towards cash approaches. This may be related to lack of experience and the limited availability of research proving the viability of such approaches. We hope that with the findings of this research we will succeed in raising confidence among NGOs about the viability, effectiveness, and empowering dimensions of
cash-based approaches housing reconstruction and to reconsider their own roles and approaches in this domain.

At the third place in terms of citizens’ satisfaction with an overall satisfaction level averaging 91.75% we find what we named the “Participatory Housing Approach”. Under this approach people had an active role in the construction of their houses and also a say on the materials, design, and location of the house. This led to housing which in terms of construction design and materials does not differ much from the houses people reconstructed in the same village under the owner-driven approach. People who obtained houses under this approach got training in seismically safe construction, which could easily be integrated in their traditional building techniques and will hopefully contribute to make also future additions safer. As shown in table 11, the only variable on which this PHA approach had a somewhat lower score is in relation to the size of the provided houses. Considering that the PHA houses had a total cost of only 47,000 Rs, i.e. 52.3% the cost of the houses constructed under the CODIS approach and 38% the cost of the average house constructed under the CODEN approach, its achievement in meeting the expectations of the people should be appreciated.

Table 12: Number of dwellings before and after the 2001 earthquake by housing reconstruction approach (N=434)

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

Source: Household survey, December 2004-February 2005

Among the two contractor-driven approaches supported by Swiss Solidarity, table 11 shows that although overall satisfaction under the “Contractor-driven Village Reconstruction Approach in Situ” (CODIS) is 12.5% lower than under the PHA approach, it nevertheless still managed to satisfy high rates of citizens with regard to location and size. However, it scores low on quality of materials and construction, which are the main factors used by humanitarian agencies to justify employing professional construction companies. As was discussed, contractors have a preference for industrial construction materials and technologies, which may not be adapted to the local climatic conditions. Insufficient water for adequate curing of the RCC constructions was a serious constraint under the CODIS approach leading to cracks in the walls and water infiltrations. This problem could be mitigated in several cases thanks to house owners’ commitment to participate in construction, in particular for curing the RCC walls. The case study indicated however, that people believe that the quality problems were not only caused by climatic constraints, but also by the vested interest of the contractor whom they felt made and saved money at their expenses.

Finally, by far the less appreciated approach was what we named the “Contractor-Driven Reconstruction Approach ex-nihilo (CODEN). The names given to the two contractor-driven
approaches suggest that the main difference between them is the emphasis of the latter on resettlement. One would thus expect differences in satisfaction with regard to location. Given the fact that the new villages were located contiguous to the old ones, this was not really the main issue. Dissatisfaction and frustration in these villages was very high on a number of issues that cannot be assessed through a household survey, such as lack of participation, elite capture of decision making and project benefits, blunt discriminations in favour of the local elite, and disruption of family networks. What came out however very clearly from the household survey is people’s strong dissatisfaction with the quality of construction, whereby only 3.5% of the households expressed satisfaction on this issue. The majority of the households reported various deficiencies such as cracks in walls and ceiling, water infiltrations, and poor quality of doors and windows. These factors led to high level of tensions, to a diffused sense of betrayal and to insecurity. Where people had the option to stay in their old houses it led to a mass refusal to move to the new village. Also in this case the poor quality of construction was generally attributed to the vested interests of the construction company, which in this case, being closely associated to the NGO did not even undergo a formal tendering procedure. Ironically, the project that was less appreciated by the people was the most expensive one supported by Swiss Solidarity with a financial investment in housing per household almost five times higher than the most appreciated subsidiary housing approach. As shown in Table 12, though each approach has actually contributed to a massive increase in number of houses, the most striking difference raise in number of houses, if we consider that the CODEN villages are relatively well-off, was found under this approach. Indeed, whereas in the villages which were assisted through a subsidiary approach the raise of house may to some extent be attributed to the poor housing condition prior to the earthquake, this was not the case of the CODEN villages, whose housing conditions before the earthquake, in terms of number of dwellings was satisfactory.

To conclude this study shows that the cheapest approach towards post-disaster housing reconstruction was the most effective one in reaching the most neglected communities and in satisfactorily meeting their housing requirements. On the other hand the most costly approach may definitively have contributed to make rich people richer and poor people more vulnerable. The study shows that 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. The research thus provides good empirical evidence that prove the viability of cash based approaches in emergencies, which are more empowering and dignifying for the concerned people. These goals are fully in line with most NGOs objectives but yet need to be translated into their operational strategies. We hope that this study, which allowed hundreds of people that have survived the devastating Gujarat earthquake to tell what they think is more suited to restore their livelihoods will encourage concerned agencies to reconsider their approaches towards post-disaster housing.
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