Building Habitats

Process Document
SIFFS’ Tsunami Habitat Reconstruction Project
Nagapattinam, Tamil Nadu, India

South Indian Federation of Fishermen Societies
Karamana, Trivandrum, Kerala, India
June 2009
Rebuilding Habitats: Process Document
SIFFS’ Tsunami Habitat Reconstruction Project
Nagapattinam, Tamil Nadu, India

June 2009

Published by
South Indian Federation of Fishermen Societies (SIFFS)
Karamana, Trivandrum - 695 002, Kerala, INDIA
Email: admin@siffs.org, Web: www.siffs.org
www.tarangambadi.in

Document Prepared by
Sajith Sukumaran and Rukmini Datta

Design and Layout by
C.R. Aravindan, SIFFS

Printed at
G.K Printers, Kochi
Contents

Preface
Acknowledgement
Acronyms
26th December 2004 ................................................................. 1
Relief activities by SIFFS: Highlights .................................. 2
Reconstruction: Nagapattinam ............................................ 4
Public housing ........................................................................ 5
SIFFS’ approach to housing .................................................. 6
Government Order .................................................................. 6
Highlights of the Government guidelines ............................. 7
Concerns with the Government guidelines ......................... 7
Adapted guidelines ............................................................... 8
Land allotment ....................................................................... 10
Habitat mapping .................................................................. 11
Mass contact programme ..................................................... 12
Design of the village ............................................................. 14
Finalising beneficiary lists .................................................... 15
Cluster approach ................................................................. 17
Model houses ......................................................................... 19
Feedback on model houses .................................................. 20
Selection of options .............................................................. 20
“Face to Face” to finalise individual house designs ............ 21
Cost of construction ............................................................. 22
Construction ........................................................................ 23
Introduction of piece rate system ........................................ 23
A new method in construction ............................................. 24
Construction management system .................................... 24
Quality of construction ......................................................... 27
Sanitation ............................................................................. 28
Monitoring............................................................................ 30
Project financing ................................................................. 31
Roads, electrification and lighting ....................................... 32
School building ..................................................................... 32
Follow up project ............................................................... 32
Challenges ............................................................................ 32
Annexures

1. Inundation map – Chinnangudi .................................................................37
2. Habitat Maps ........................................................................................................38
3. Habitat mapping - Chinnangudi, result summary ..........................................44
4. Map “To move or not to move“ .................................................................45
5. Lay outs .........................................................................................................................................46
6. Drainage map of Tarangambadi .................................................................52
7. Model houses – Summary ...............................................................................53
8. Drawing of various House Options ....................................................................54
9. SIFFS Reconstruction Project – Monitoring Process Flow Chart ..60
26 December 2004

On 26th December 2004, the Indian coastline experienced one of the most devastating tsunamis in recorded history. Tamil Nadu was the worst affected among Indian states. Nagapattinam in Tamil Nadu was the district that suffered the most. Tarangambadi and Chinnangudi were among the fishing villages of Nagapattinam that encountered extensive loss of life, property, and livelihood.

Tarangambadi is a relatively large village with 1,725 households. The village population of 6,991 comprises mainly fishing community (1,112 households). There are also Christian and Muslim families. They are engaged in other occupations. Dalit populations inhabit Velli Palayam, Puthu Palayam, Kesavan Palayam and Karantheru hamlets on the periphery of the village.

Chinnangudi is a smaller village with 563 households and 2,475 people. Apart from two Muslim families and three Dalit families, the rest are from the fishing community. In both the villages, most of the people live close to the sea because of their occupational needs.

The tsunami killed as many as 304 people in Tarangambadi, of which more than 150 were young children. 904 houses were fully damaged. Another 266 had partial damages. A large number of fisher households lost valuable productive assets. This included 128 of the 168 FRP boats, 35 out of 50 kattumarams, and 165 out of 175 motorised kattumarams.

In Chinnangudi 137 houses were completely destroyed, and 131 were partially damaged. Fishing gear and nets were lost or damaged. The village suffered 48 deaths, 22 among them were children.

---

1 FRP boat means a boat moulded out of Fibre Reinforced Plastic. The most common FRP boat on the Coromandel coast is called the Marackanam boat or Maruti boat.

2 Kattumaram is a traditional fishing craft made by tying a few shaped logs of albizzia tree together. This has been a popular craft on the surf beaten coasts of south India. Kattumaram literally means logs tied together.

3 All data from documentation undertaken by Praxis, 2005
In Tarangambadi, the low lying northern part of the village where most of the fisher people lived suffered near total damage. Houses in the southern part, which was more elevated with good vegetation and less density, suffered much less. This incidentally has also been the historic part of the village, where Danish settlers of the seventeenth century constructed buildings.

Similarly, in Chinnangudi, the houses that were fully or badly damaged were those close to the beach where the elevation is lower than the rest of the village. The core of the village is on higher ground than the peripheries and suffered very little damage. The low lying edges of the village caused the water to rush in faster around the northern and southern peripheries. Water rushed in through the creek on the southern end with enormous force causing great damage to life and property.

The southern side of the village gets flooded due to Amman river frequently. People living close to the river had taken precautions to build their houses on a raised plinth. Consequently, they suffered no damage.

Thus the nature and extent of damage apparently had certain patterns. While low lying areas underwent extensive damage and destruction, even temporary structures at higher elevations survived. Areas with better vegetation also showed higher resistance to the waves.

Relief Activities by SIFFS: Highlights

South Indian Federation of Fishermen Societies (SIFFS) is the apex body of 150 village level fish marketing societies in Kerala, Tamil Nadu, Andhra Pradesh, and Pondicherry. It provides a wide range of services to the traditional fisher people of these states.

Within two days of the tsunami striking the coast, SIFFS made its field presence in Kanyakumari, Tirunelveli, Thoothukudi and Nagapattinam districts of Tamil Nadu and Trivandrum, Kollam and Alleppey districts
as well as the Malabar region of Kerala. It has since been involved in relief, repair, rehabilitation, restoration of livelihoods and habitat reconstruction.

SIFFS’ response to the disaster was conditioned by the fact that it had an ongoing relationship with many of the affected communities through its work with artisanal fishermen. Among the organisations which undertook relief work, SIFFS was perhaps the largest representative organisation of those affected. It was in a position of unique advantage because of its knowledge of fisheries and fishing communities. As a cooperative organisation in the fisheries sector, it had the infrastructure, people and network to reach out to many locations simultaneously. As a Non-Government Organisation (NGO) at work for the past 25 years, it had a wide range of contacts and linkages across the world.

Either through direct action or through its network of regional and district federations, SIFFS contributed to the rescue and relief work right from the stage of removal of dead bodies and debris. Relief supplies were provided to the government-run camps across the coast. In the initial period following the disaster, SIFFS focussed on filling the gaps in the relief efforts of the government and local communities.

SIFFS was involved in various ways with relief efforts - advocacy with the State, supply of relief kits containing dry rations and essential materials received from various sources, payment of compensation to members and construction of temporary shelters. It has played the roles of service provider and coordinator of relief efforts.

Among the various models of temporary shelter tried out in Nagapattinam, SIFFS model using thatch caught wide attention and appreciation. SIFFS put up 397 shelters in the district, including 135 in the Dalit hamlet of Thetti.
SIFFS ventured into livelihood restoration by setting up temporary repair centres for boats and outboard motors (OBMs) in the affected areas in early January 2005. Eventually 1,080 boats and 1,728 engines were repaired at these centres. The first group of fishermen in Nagapattinam went back to sea using boats repaired and nets supplied by SIFFS. Apart from the damaged, hundreds of fishing cafts were lost in the tsunami resulting in loss of livelihoods of thousands of fisher families. SIFFS, however, did not agree with the excessive number of boats being given away in the name of compensation. It believed that asset restoration should be limited to replacing lost assets alone. There were reasons to believe that the pre-tsunami fleet size of fishing crafts was barely sustainable vis-à-vis the fish resources available in the coastal waters. Increasing the fleet size would adversely affect the resource availability.

Apart from providing direct support through its own resources and in partnership with other organisations, SIFFS played the role of coordinator of non-government relief efforts in the tsunami hit areas. Along with SNEHA, another NGO working in the area, and with the help and advice of people with disaster relief and rehabilitation experience, SIFFS took the initiative to set up the NGO Coordination Centre on 1st January 2005. The district administration took the Centre into confidence in coordinating relief activities. It was later rechristened the NGO Coordination and Resource Centre (NCRC) with a larger mandate to provide a range of services to the communities and organisations involved in the rehabilitation process.

Reconstruction: Nagapattinam

SIFFS took up a project to build 1,700 houses in eight villages in two districts – four villages in Kanyakumari and four villages in Nagapattinam. The reconstruction project in Tarangambadi and the adjacent villages of Karantheru and Puthupalayam with over 1,080 houses in all likelihood would end up as the largest tsunami reconstruction project at a single location in Tamil Nadu.

For SIFFS Tarangambadi and Chinnangudi were natural choices for habitat reconstruction. These were two of the three villages in Nagapattinam district where SIFFS had fishermen societies before the tsunami. Tarangambadi society was the largest among the three. Tarangambadi also had a boat yard for an year before the tsunami. And, as indicated earlier, these were among the worst affected villages. SIFFS took up reconstruction projects for Karantheru and Puthupalayam as they were adjacent to the Tarangambadi fishing village.
Public Housing

When the Government of Tamil Nadu started its deliberations on the public-private participation in providing permanent shelters to the tsunami affected communities, the response from NGOs was quite encouraging. Public–private participation meant the Government would identify and allot land while the NGOs would construct. SIFFS, directly as well as through the NGO Coordination Centre (later NCRC) had been actively involved in the deliberations.

However, SIFFS did not have any plan to take up projects on its own. It was friends and well wishers with experience in post disaster housing projects in Bhuj and Lathur who encouraged SIFFS to consider taking up a housing programme. It was pointed out that SIFFS being a long term sectoral player in marine fisheries, it was an opportunity to utilise its knowledge and experience in devising appropriate strategies for a housing programme in the given context. It was argued that with its strong links with the fishing communities, SIFFS would be in a position to develop at least a few models that would overcome some of the critical limitations of mass housing projects seen elsewhere.

SIFFS’ starting point in planning its housing project was to study past experiences of public housing schemes. As a first step, an exposure visit of the SIFFS team and representatives of the beneficiaries of the proposed projects was organised to Bhuj in Gujarat. This was with the help of Kutch Navnirman Abhiyan and related organisations. The team was able to witness typical examples in successes and failures in mass housing projects. It also provided insights into the possibilities of appropriate designs, and use of alternatives in construction materials and methods.

 Agencies involved in post disaster housing projects have found that the beneficiaries often did not occupy the houses built for them as they could not relate to the new structures. Public housing schemes appear to have relegated recipients of the houses into standardised need brackets, building a series of identical structures for them. In recent years, there has been some investment in ensuring participation of the house owners in the designing of the houses. It has, however, been restricted to providing one or two designs to choose from, ignoring individual requirements and needs. The reasons given are many, including optimisation of cost, efficiency, and impracticality of catering to individual needs.

---

4 Bhuj is the head quarters of Kutch district, Gujarat state
5 Kutch Navnirman Abhiyan, popularly known as ‘Abhiyan’ is an umbrella organisation of more than 20 NGOs. These NGOs have been involved in the post earthquake rebuilding of Kutch district.
SIFFS’ Approach to Housing

Learning from the experiences of past public housing projects and committed to giving due respect to peoples’ needs, SIFFS took up the project with a resolve to build habitats; not just houses. It was understood that if the houses were not built according to the villagers’ needs, it would be yet another disaster involving colossal wastage of money and time.

The question to be addressed was, what could be the right strategy for an effective housing project in the given context? Could there be an alternative that would overcome the limitations caused by the three aspects of typical projects – callousness towards community perception, lack of attention to individual needs, and contractor driven method which pre-empted the possibility of people’s participation in the process?

Through a series of planning and brainstorming sessions, SIFFS devised a strategy that had factoring in people’s needs, aspirations, life styles, and socio-cultural norms as an important component. The idea was to go beyond mere provision of four walls and a roof; and to see houses as customised products having cultural, economic, technical and political dimensions. Ensuring community participation was considered the core of the strategy. Thus, SIFFS formulated an ambitious plan to customise the houses for all house owners in a participatory manner.

The maxim was “2,000 houses in 2,000 designs” and SIFFS was confident of achieving it with the right approach to planning, design, layout and construction combined with a positive mix of scientific temper and sensitivity. While meeting the livelihood requirements of the community and safeguarding them against future calamities, SIFFS incorporated the following elements to ensure a human dimension in its project:

- Ensuring the participation of house owners right from the early design stage through the entire construction process.
- Taking into account people’s social and cultural needs while planning their houses.
- Ensuring a feeling of ownership of the houses by house owners.

Government Order

The Government of Tamil Nadu issued an order to act as guidelines for constructing new houses in the tsunami affected areas of the state. The guidelines were made on the basis of the location of houses with respect to the high tide line.

Some highlights of the Government order included the following. In all cases where new houses were given, the old site and the old house had to be relinquished; all the new houses were to be insured for ten years at the cost of the executing agency; the title deed of the house would be given jointly in the names of the wife and husband (in case of their death, to the survivor and eldest child).


### Highlights of the Government Guidelines

(G.O. Ms. No. 172 dated 30 March 2005)

<table>
<thead>
<tr>
<th>Houses located within 200 metres of the high tide line</th>
<th>All house owners of fully and partly damaged kutcha and pucca houses were given the choice to go beyond 200 metres and get a newly constructed house worth Rs 150,000 free of cost.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Those who chose not to move were permitted to undertake repairs of their existing houses, with no assistance from the government.</td>
</tr>
<tr>
<td></td>
<td>For those living in houses which were not damaged, the options were either getting a new house beyond 200 metres or to continue living in the existing location.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Houses located between 200 and 500 metres of the high tide line</th>
<th>All house owners of fully/partly damaged kutcha houses and fully damaged pucca houses were given the option of moving to new houses beyond 500 metres of the high tide line.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>If the house owners were not willing to move beyond 500 metres, houses would be constructed for them in the existing location.</td>
</tr>
<tr>
<td></td>
<td>For the repair of partly damaged pucca houses, financial assistance would be provided by the government on pre-determined scale based on the assessment of the damage</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Houses located beyond 500 metres of the high tide line</th>
<th>All house owners of fully/partly damaged kutcha houses and fully damaged pucca houses were given the option of moving to new houses beyond 500 metres of the high tide line</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>If the house owners were not willing to move, houses would be constructed for them in the existing location.</td>
</tr>
<tr>
<td></td>
<td>For the repair of partly damaged pucca houses, financial assistance would be provided by the government on pre-determined scale based on the assessment of the damage</td>
</tr>
</tbody>
</table>

### Concerns with the Government Guidelines

The Government’s offer of a new house with title deed, 500 metres away from the high tide line was something few people could refuse since the houses and plots occupied by the villagers before the tsunami were largely without title deeds. However, there were some concerns with the government order.

- Many houses on the beach were valued at more than what the government was promising to give – three cents of land and a house with a plinth area of 325 square feet. SIFFS’ data showed that only nine percent of the people in Chinnangudi had less than what the government was giving them for free. Moreover, some house owners had built houses which were valued at more than Rs 150,000.

- The Government guidelines were silent on the requirement of joint families, a common occurrence among fishing communities. There would be a need for...
ensuring the possibility of extension in the houses constructed.

- The differences in cost of land across villages had not been taken into consideration. In Tarangambadi, for instance, the cost of land was higher than in Chinnangudi. The implication of this was that house owners might not be able to purchase new plots in Tarangambadi in future for extension purposes. Allotment of larger plots of land would have resolved this predicament in future.

- The government acquired land at the rate of one acre per 25 houses, which left little open space for recreational use and for public buildings.

- One of the fears expressed by the community was that the vacated beach land would be used for purposes of tourism and fish hatcheries, resulting in the fishing community losing its right to use it for fishing activities.

Adapted guidelines

SIFFS’ contention was that the risk of inundation by a future tsunami was a function of elevation, and not of the distance from the sea. It carried out a hazard mapping exercise to ascertain the risks of the new site and the existing habitat based on the inundation during the tsunami. A detailed contour survey of the villages was undertaken to assess the risks. The method used was a scenario analysis in which the extent of inundation caused by waves of various heights in different points in the existing villages was mapped. The same method was used to assess the safety of the newly allotted sites. The exercise showed that certain existing locations were safer than the new sites identified for construction, since the latter were low lying. Based on this study, SIFFS decided to rework its strategy for the reconstruction of the houses. The safety of the new location vis-à-vis the existing location was communicated to the villagers. The following guidelines were worked out in consultation with the traditional panchayati and the people of Tarangambadi and Chinnangudi.

- Houses within the 200 metres of the high tide line would be relocated to the new site. The new site, wherever it was low-lying and where water stagnated during the rainy season, would be raised by filling.

- Every house owner beyond 200 metres could decide to stay in the existing location or move to the new location.

- In the new location they would be provided with three cents of land and a reinforced cement concrete house of about 350 square feet.

- If they wished to stay back in the same location and if they possessed

---

6 Traditional panchayats are village institutions that play a central role in the lives of the communities. These institutions are especially strong in the case of fishing communities such as the Pattinavars of the Coromandel coast. Both Tarangambadi and Chinnangudi are villages dominated by Pattinavar sub caste and therefore traditional panchayats play critical roles. These panchayats should not be confused with the Panchayat Raj Institutions (PRIs), which are constitutional entities with democratically elected leadership.
those families who possessed a plot of land smaller than what was needed for constructing a house under the project and still wished to stay back, the onus was on them to ensure the required plot size.

Families opting for the new site had to relinquish their existing house and the plot. Such plots were to be used for common purposes such as widening of roads or in some cases for allotment to those staying at the same old sites and owning less than three cents of land.

Those who wanted to continue living in their existing houses and wanted repairs and improvement in them could do so accordingly and SIFFS would assist them depending on each house owner’s requirements.

There would be an attempt to give a minimum of three cents to each family and vehicular access for each plot in the existing village. Drainage, sanitation and the roads would be properly planned. Common amenities and public buildings would be distributed in the existing and the new site according to the distribution of the population and the planning exercise that was being carried out.

In case houses had to be built in the high and medium risk areas, the ground level and the plinth level would be raised to make the building safer.

Proper security of tenure and ownership would be ensured to the house owners who had decided to continue in their original plots, with the assistance of the Government.

Demolition of the existing house was made mandatory for those choosing to move to the new location. The existing house would have to be demolished and the land handed over to the government before moving in to the new house.

Discussions on these lines with the villagers had a drastic effect on people’s decision regarding the location of their house with many people deciding to stay on. As mentioned earlier, for many house owners who had good quality houses, the incentive of getting three cents of land and a house worth Rs 150,000 was unattractive. Those who owned more than three cents of land did not want to vacate the plots, because they could get a new house in the existing location itself.

The critical question at this juncture was how many families would opt for the new site and how many would stay back in their original place. As indicated earlier, having own land was a pre-requisite to get a house constructed at the original site. They had the option of buying land from a neighbour or so, but the onus was on them. If there was no land available, they had to move.

The decision to move or not to move also was prompted by the results of the hazard mapping that SIFFS presented to the villagers.
As mentioned earlier, the results had shown the extent of inundation caused by incoming waves of different heights. It showed, for instance, why the central portion of the Chinnangudi village escaped damages even as the beach front area was submerged and the waves damaged areas away from the centre. It clearly brought out the fact that some of the newly allotted plots could be more prone to flooding than the existing habitations. Annexure 1 shows the inundation map of Chinnangudi.

Subsequently, those within the 200 metres of the high tide line moved to the new location. A relatively good stock of houses were repaired, not demolished. The old and the new would, thus, combine to create the redefined and safer villages in Tarangambadi and Chinnangudi. Further, the land being relinquished by the house owners moving to new locations could be used for common purposes such as widening of roads, etc. Following the SIFFS’ studies that showed the vulnerabilities of different areas in the village, the traditional panchayats in both the villages decided that all the families within 200 metres of the high tide line would shift to the new site.

Land Allotment
Identification of appropriate land by the government turned out to be the first major hurdle in the habitat reconstruction programme. The government was working under tremendous pressure. In Nagapattinam district itself, the government had to identify land for constructing more than 18,000 houses. The land had to be safe, at the same time not far away from the sea, as most of the beneficiaries were fisher people for whom easy access to beach was essential.

With the need to optimise the elevation, distance from the high tide line, and access to the beach, land allotment for construction was like a jigsaw puzzle. In spite of the best efforts, the Government struggled to find land that met the norms and was also acceptable to the people. For all the villages where SIFFS had taken up construction, the land allotted was
low lying. But there was no other land available. Therefore SIFFS decided to go in for land filling, knowing the costs and effort associated with such a decision.

Land allotted in Tarangambadi was inadequate. There was even litigation involved in one case. The matter was complicated. SIFFS had to remove the land filling from a large plot and clear it even after it was allotted for construction because of litigation. People of Chinnangudi refused to accept the allotted land as they thought it was far away from the beach. It was a complex situation. A decision continued to be elusive also because of the lack of effective community leadership in Chinnangudi. The district administration tried to find alternative plots. But ultimately people had to settle for what was allotted, well away from the shore. The distance of the new habitat from the sea shore is likely to have implications for their livelihoods.

The land allocation problem continued for several months, delaying the initiation of the project. Then land filling further delayed actual construction.

**Habitat Mapping**

One of the early decisions in the SIFFS habitat reconstruction project was to make an attempt to understand the way the people of Tarangambadi and Chinnangudi lived. A habitat mapping exercise was carried out in the old village settlements to understand the use of space and people’s needs and aspirations associated with them. Individual houses were studied to understand the needs, cultural values and design preferences they embody. It included the study of not only the distribution of houses and the usage of space within the houses, but also the common spaces and the village as a whole. This was the beginning of a longer and dedicated process of taking the designing of the houses to micro and individual levels.

The habitat mapping exercise was aimed at integrating local knowledge and scientific data. It was a combination of social mapping, resource mapping and mobility mapping and comprised the collection of architectural data, visual documentation and interaction with residents. The study was done using the following method.

A total station survey of the topography of the villages was carried out containing details of streets in relation with the beach and river; electric posts, telephone posts, wells, water taps, hand pumps, etc.; contours of the land at an interval of 0.25 metres; location of public buildings and vegetation in the common areas. Base maps were divided into ‘grids’ which showed the village divided by the streets.
These maps were developed into thematic maps by adding layers of information on the village collected through field surveys. The maps were used to create enlarged grid maps containing features of a cluster (a group of houses surrounded by streets on all four sides). Subsequently, details of individual houses, as they existed before the disaster were collected through visits to the clusters. The details included plinth area, building material used, number of doors, vegetation around the house, measurement of indoor and outdoor spaces and information about residents. The field survey was conducted by a team of architects and student architects from different parts of the country. The total station survey and manual survey were complemented by visual documentation of details of the habitat of the old village. Some of the maps are provided in Annexure 2.

The results of the Chinnangudi settlement study and habitat mapping were brought out as a special volume. Similar volume of Tarangambadi was also prepared but was not published. Annexure 3 provides an indicative list of observations from the Chinnangudi survey.

**Mass Contact Programme**

A mass contact programme was organised in Chinnangudi to understand people’s needs and aspirations associated with their houses. At the programme, four paper models of preliminary designs were presented and people’s choice and feedback elicited. The questions asked ranged about preference for construction material, location of *pooja room*7, kitchen and toilet, need for storage space and veranda, potential for expansion of the house, and occupational requirements associated with the house (storage of nets, engines, etc.).

A detailed socio-economic survey was carried out subsequent to the habitat mapping exercise to ascertain the habitat condition in the old village. The survey looked into the various aspects of life within the fishing villages. It covered sex wise and age wise data on each family, educational level of each member, sources of income and details of occupation. Families were classified into two – nuclear and joint. This forms an important classification among coastal communities. Information on those physically or mentally challenged was also collected.

Information on the land assets possessed or occupied by the families along with the details of title deeds or other documents was collected. Age and types of the house in which they lived before tsunami were also estimated.

---

7 Prayer room
Details on amenities such as electric connection, drinking water supply, and toilets were collected. In case the family had suffered deaths in the tsunami, the details of that were also collected for cross verification. The survey ended with questions on where the family would like to have their new house constructed and also the reason for the choice.

The socio-economic survey brought out many aspects of the lives, lifestyle, amenities, economic condition, and livelihoods of the villages. In spite of the presence of a hundred year old school in the village, the level of illiteracy among the elderly was found to be shockingly high. Current enrolment of children in school was found good, especially for girls. A majority of the people depended on fishing and related activities for livelihood. Fish vending by women came up as a substantial source of livelihood in both Tarangambadi and Chinnangudi.

While around 60% of the houses were electrified before tsunami in both the villages, a near total absence of household toilets showed poor sanitation systems in the village. While most of the households had a permanent space for cooking, around 40% of the families preferred to have the cooking space outside the house. A majority of the households pointed out the importance of pooja room, or a space earmarked for that. When asked about neighbourhood preferences, 77% of the families maintained that they would like to have the same neighbours in the new settlement as well. The survey also found that 24.8 per cent of the people wanted to stay in their existing plots.

The socio-economic survey had a question on the family preferences in this regard. Based on the response to the query a ‘To Move or Not To Move’ map was prepared, which was to become the base document on which further negotiations were held. The map for Chinnangudi is given in Annexure 4.

The reports of the socio-economic surveys were not published. However, the purpose of the surveys was served as the results were used in two important stages – they were first used for finalising the list of beneficiaries, and then as the base line data for the face-to-face meetings with the families to finalise their requirements for customising the designs. Family level data tables obtained from the socio-economic surveys formed the base document in the ‘individual beneficiary files’ maintained at the SIFFS site offices for planning and monitoring.
There have also been studies that were carried out along with the construction process. Two batches of students, Indian and foreign, were engaged as ‘interns’. These students were entrusted with the task of preparing a master plan for the area and in mapping the drainage canals in the area. The web site for the project was developed by a volunteer from Bulgaria.

**Design of the village**
Two layouts were made for the design of the new village in Tarangambadi, one based on a *grid* layout and the other on a *cluster* layout. The density of habitation was less in the cluster layout due to the additional common spaces provided therein. However, the fishermen *panchayat* selected the *grid* layout as they found it more appropriate to check unauthorised encroachment of open spaces. The *grid* layout had been made pedestrian friendly with open spaces on alternate streets and children’s play area interspersed. The different lay outs are given in Annexure 5.

The Government had stipulated a house density of 25 per acre. Each house was to be built on three cents and the balance 25 cents were to be assigned for common space. Initial studies had shown that the requirement of common space was much higher and hence, in Taranganabadi the house density was fixed at 20 per acre. In Chinnangudi, it was fixed at 16 houses per acre.

The construction sites were elevated by land filling so that even if water rises to 2.1 metres above the mean sea level, it will not enter the houses. This was done for all the sites including Tarangambadi, Chinnangudi, Puthuppalayam and Karantheru, after studying the natural drainage system in the village.

Land filling was considered problematic even at the time of taking this decision. It was pointed out that land filling would push up the over all investment in construction substantially. In addition, it was clear that land filling would block the natural drains.
and thus adversely affect the micro-environment and could lead to flooding in future. The delay caused by land filling, it was argued, would further increase the costs of construction.

Despite all these valid arguments, SIFFS decided to go in for land filling mainly for two reasons. One, the hazard mapping had clearly shown that the new building sites were not safe even under normal flood conditions. Two, all efforts to find alternative sites had failed and SIFFS had to construct on the allotted land, howsoever unsafe it was.

Natural drains at the sites were mapped and documented before initiating land filling. These maps could be used for scientific drainage planning for the new habitat. Drainage map of Chinnangudi is given in Annexure 6. Experience during the subsequent rains showed that the fear of excessive flooding of the area due to blocking of natural drains was possibly misplaced or at least exaggerated. There was no substantial flooding in spite of good rains. However, scientific drainage planning is necessary for flood proofing for future.

The initial decision was to do land filling for all sites, old and new. However, it was soon found unfeasible for old plots as they were not in a continuous stretch. Therefore land filling was limited to the new site in Tarangambadi, Karantheru and Puthupalayam.

**Finalising Beneficiary Lists**

Finalising the list of beneficiaries of the habitat reconstruction project turned out to be a long drawn process in which traditional panchayats, the critical decision making forum for the fishing villages played a major role. Those who had lost their houses completely and had been living in temporary shelters since the disaster were to be given priority. Others had to wait. This was accepted in principle.

A set of criteria for beneficiary selection was drawn up based on (1) the guidelines in the
Government order and (2) the results of the settlement study which showed the details of house ownership before tsunami including the type of houses. A map was prepared which showed the house types as they existed before the disaster. The following criteria were evolved.

- **Criterion 1**: ‘A house for a house but based on where you lived’. All those who had a house within 200 metres from the sea would get a new house in the new settlement, based on the principle of ‘a new house for a house already had’, validated by the findings of the settlement study. Beyond 200 metres, the families could opt for having the new house constructed in their old location, provided they had 3 cents of land with them.

- **Criterion 2**: ‘Each family within a joint family to get a new house’. Fishing villages traditionally have the system of joint families. Making a family eligible for a new house therefore was problematic. Through several rounds of discussions with the communities and other stakeholders, it was resolved that every family within a joint family would also be entitled to a new house.

- **Criterion 3**: ‘Criteria for special cases’. A widow or widower staying with a married son was excluded from the beneficiary lists. However, in such cases, the new house would be registered jointly on the names of the widow/ widower and their son. Widows or widowers staying alone were included.

The process of finalising the beneficiary list was through a four-day long session that was held between the SIFFS team, the traditional panchayat and other stakeholders. The list that SIFFS had prepared based on its surveys cross checked with the list generated by PRAXIS through micro-planning exercise was compared with the Government’s list. The habitat maps prepared from the settlement study were useful in this process. The number of houses to be constructed was brought down from the originally estimated numbers substantially through this process. The final beneficiary list for Tarangambadi had 1080 houses and that of Chinnagudi had 543.

SIFFS insisted that the beneficiary list be finalised before the beginning of construction. It could only be achieved in part, but the beneficiaries for the first set of houses were selected before the beginning of construction.

Among the beneficiaries, those who were selected based on the first criterion, i.e., having lost a house within 200 metres from the sea were eligible for the first set of houses. Some discrepancies crept in here and a few families selected as per the second criterion got wrongly included in the first list. An ideal step would have been to allot one house to the joint families and subsequently meeting their claim for the newly recognised families. Even after such an elaborate process, there were still errors in the beneficiary list. These errors, mainly about duplication of claims, were subsequently corrected in consultation with the traditional panchayats. Beneficiaries were given an option to decide on their neighbours. Most of the families chose their pre-tsunami neighbours in the new settlement as well. In the first set of houses in the new settlement, these preferences were given
priority. Even though this could not be met in all subsequent cases due to various reasons, more than 80% of the families have got the neighbours of their choice. This is sure to add to the social cohesion in the new settlements.

SIFFS retracted from the original commitment given to Chinnangudi village on the number of houses that would be constructed. There were a few valid reasons behind this. Firstly, the original village in Chinnangudi had a number of good houses. Almost all families wanted a new house; however did not want to relinquish their original house in the main village. The panchayat and the villagers were harping on a ‘two house theory’ which was in discussion at that time. There were problems when SIFFS revised the number of houses to be constructed. Ultimately when the construction is over, all those who really did not have a roof over their heads would have got a new house.

Cluster Approach

The total habitat reconstruction project has been divided into clusters of 25 to 50 houses each. This was to ensure better management of the planning and construction process, greater attention to details and to meeting individual requirements, and eliciting participation of every house owning family. The house owners in each cluster selected five to six members from among them who comprised the cluster committee. Their role was to address issues within the community and to monitor the quality of construction.

A cluster volunteer, identified from the village by the cluster members, was to oversee the construction process and to liaise between SIFFS and the community. This was in addition to the house owners monitoring the quality of construction of their houses; they were taken through classroom sessions on quality assurance.
The concept of cluster volunteers was as paid community workers. As construction progressed, cluster volunteers emerged as true leaders of their clusters. In addition to the roles specified for them, most of them started effectively supervising the construction process. In the process they also gained technical skills. Four cluster volunteers were eventually promoted as supervisors considering their skills and experience.

Even though the original idea was to find a cluster volunteer for each cluster from the corresponding cluster itself, this was not strictly followed. The first set of cluster volunteers excelled much beyond expectations and therefore they were maintained for the next phase as well. In addition to construction work cluster volunteers also took part in the IEC campaign on water and sanitation organised as part of the project. Six volunteers were continued till the end of the project.

A unique feature of the SIFFS reconstruction project vis-à-vis other public housing projects was its insistence on allotment of plots before the construction process so that house owners could participate at every stage of construction. The fishermen’s panchayat allotted plots of land to house owners, in keeping with the old settlement pattern.

Allotting plots before the beginning of construction, or the fact that each family knew which was their plot and could see their house coming up in front of them, was probably the most critical factor that triggered active participation by the families. Of course their involvement at the design stage and their active role in customising their own house had set the stage for participation.

Plot allotment just changed the whole environment. Families literally took over their plots, conducting bhoomi pooja, involving in

Door Pooja being performed
curing of the masonry work, installing doors and holding *door pooja*, checking the quantity and quality of materials that went into each stage of construction, complaining about any fall in the quality of workmanship at any stage, getting back to the SIFFS team to clear doubts, approaching the site office if work was stopped for a day or two, complaining in case they felt that anybody else was getting any undue favour or they were denied something which they thought was their due and so on.

Every cluster was assigned a construction team comprising an engineer and architect to attend to the technical aspects, and a community development officer to address the social aspects of habitat building. SIFFS identified the social facet of construction as integral to the construction process. Cluster engineers, who were trained in quality supervision, were also taught the nuances of maintaining a positive rapport and channel of interaction with the community.

Cluster committees worked well initially. It was women who dominated the meetings of the committees. There was a stage when it appeared that the cluster committees would even evolve into institutional systems for management of the new settlements in future. However, as construction progressed, cluster committees became less active. Ironically, one of the reasons that made cluster committees inactive was the role of cluster volunteers. The volunteers, who came up from the same village were trusted by the people to look after their interests well.

**Model Houses**

Based on the habitat mapping exercise comprising interaction with house owners and technical surveys, six model houses were constructed in actual dimensions. They were created to give a range of options to house owners in keeping with their needs and aspirations regarding their future dwelling. A summary table showing the details of model houses is provided in Annexure 7.

The concept of model houses emerged as part of an effort to involve people in designing their own houses. When paper models were presented to the families, they were able to visualise the design to a large extent and comment on them. At the same time it was clear that they would be able to engage more meaningfully in the design stage if actual model houses were built. The model houses, as expected at the concept stage, provided the much needed ‘touch and feel’ effect, thus encouraging the families to get seriously involved in the designing process. Even the SIFFS team did not realise its full impact at that stage, as they could not have visualised the extent to which the families would go in for...
customisation and improvisation, during the later stages of the project. It is a fact that, as things emerged, some of the later improvised models only hold distant similarities to the original ones offered through the model houses.

Feedback on Model Houses

- There was a need for more built-in shelves in the houses.
- Many house owners raised doubts about the continuous sunshade at the roof level and asked for flat sunshades above the windows alone.
- Some questions were raised about the position of kitchens and the rear door.
- The traditional panchayat in both Tarangambadi and Chinnangudi were keen on reinforced cement concrete framed structure instead of load bearing walls.

The communities raised a few demands for common structures also – community hall, open air stage near the temple, and a memorial for tsunami victims.

Selection of options

Model II was the preferred option of most families perhaps because it came closest to
a traditional house plan. The house had four rooms which suited the need of large families. Although the model did not have a veranda, the house owners could build one using non-permanent material. The location of the pooja room and the front and rear doors were in keeping with cultural norms.

Model III, which is two-storied, was selected by some people who wanted to stay back at their original homesteads but had serious space constraints.

Model IV was selected because of its veranda with arches. Although the model did not have a pooja room, house owners decided to add one of their own at the rear of the house.

Model I, which is the only one with an attached toilet, was by families on the condition that the entrance to the toilet would be shifted to outside the house.

Many house owners wanted to move the kitchen outside the house and use the allocated space within for other purposes.

‘Face to Face’ to Finalise Individual House Designs

The house owners were invited to have a look at the model houses and their feedback and suggestions sought. Face to face meetings between the families and a team including a member each from the architects’ team and the community development team were held in order to finalise the design of house for each family. Every resident was allotted a specific time slot in which they were to have a face to face meeting, independent and free of the
influence of any other house owner. Their doubts and concerns were noted and clarified. Suggestions were incorporated in the design wherever possible. These included proposals for customisation as well as provision for expansion in future. Set off from the boundaries was also decided by the families. Once a house plan was jointly finalised, a confirmation signature was availed.

These were negotiating sessions as well, with families trying to maximise their benefits within a framework provided by the SIFFS team around the model houses, and the latter explaining the trade off involved in customising each component.

The process of customisation became so elaborate that a few models that look completely different from their original designs emerged. These new models are popularly known as ‘Rotated’ options, which may be referring to the difference in orientation of the new house with respect to the original design. For instance, Model House Option 1 was altered by providing for a veranda by shifting the staircase away from its original position. Orientation of the living room and bedroom have also been changed. Model House Option 4 was altered by shifting the staircase and providing an extra roof over the space left open. The drawings of various options are provided in Annexure 8.

**Cost of Construction**

The original estimates for the various models were around Rs 160,000; about Rs 10,000 above the cost stipulated by the Government. However, the decision to use frame structures instead of load bearing walls instantly pushed up the estimates substantially. There were also problems with the initial estimates of labour rates. Labour was not available at the rates fixed. The rates had to be revised more than once. Adding to it was the sharp increase in the prices of building materials. Prices of cement, steel, bricks, and sand started going up at an unexpected pace. Delays in the construction process added to it. Finally, by the time the first set of houses were handed over, the cost per house had gone up to around Rs 290,000. The average cost per house was Rs. 256,000 in the entire project.

The escalation in cost within six months of initiating the construction process was 43% of the original estimate. This was mainly due to the decision to shift to frame structures as demanded by the community. Therefore at the beginning itself the estimates had to be
revised to around Rs 200,000. The cost of construction kept rising all throughout the project, the total increase almost doubling over the next couple of years. Even though the cost escalation could mostly be attributed to the rise in material prices compounded by the delay in construction, overlooking a few indirect costs at the planning stage also contributed to it.

The escalation of costs meant serious problems to SIFFS and its partners. Among others, SIFFS’ lack of experience in implementing similar projects had been a critical factor that caused such errors at the planning stage. Lack of prior experience was behind adopting a wrong strategy in Chinnangudi also. The initial tests suggested the need for piling there. Piles were fabricated for this. However, once the construction started, it was found that piling was not possible. But changing the design was delayed for various reasons. Finally, the method was abandoned after a field visit by the structural engineer and a team of experts.

**Construction**

It was decided very early in the planning stage that SIFFS would attempt to overcome the typical limitations of mass housing projects. The decision to avoid contractors in the construction project was part of the strategy. This was considered important in ensuring the central role of the community in the entire project life cycle. It was decided to set up SIFFS’ own team and systems to manage the project. Contractors were to be used only to provide labour to the project.

Once the actual construction took off, it became increasingly difficult to get adequate labour for the project in spite of revising the scheduled rates of wages. There was natural shortage as post tsunami housing work was going on simultaneously in many villages in Nagapattinam district. In addition to this was the artificial shortage caused by small time labour contractors who defaulted on payment to the labourers. Work was delayed quite often and interrupted at times due to such shortage.

It became clear that SIFFS had to devise new strategies to progress further in the project. The labour shortage became so acute at certain stages that various other options including outsourcing were considered and discussed. The community was getting upset with the delays. The SIFFS team was developing distress symptoms as they found it difficult to move forward. Even repeated hikes in labour rates did not help in breaking the stalemate. Targets were slipping and the project was stagnating.

**Introduction of ‘Piece Rate System’**

It was at this juncture that the SIFFS construction team came up with an idea they called the ‘piece rate system’, which proved to be highly effective in managing labour at the work sites. The system involved breaking up of the construction process of an individual house into several stand alone components such as excavation, foundation, wall masonry, pillars, roofing, plastering etc.

The smallest component of work was arrived at in such a way that a small group of people could finish it in a day’s time. The number of people needed for different components was obviously different. For instance, a much larger team is required to finish the roof concreting of a house compared to flooring or excavation. Remuneration for completing each of these components was worked out based on the over all cost of each design.
Labourers were invited to pick up any of the components and complete them. Once a group completed a component, the payment was made to them the same day at the site office. This proved to be highly effective for the following reasons.

- The new system eliminated the need for labour contractors and encouraged small groups of workers taking up components of work.
- As the payment was made directly by SIFFS to the groups, the workers instantly developed confidence in the system.
- The system allowed scope for specialisation. For instance, if a small group found that their strength was in roof concreting, they could focus only on that component and take up enough assignments at the sites.
- As the payment became instant and regular, people found it easy to stick on with the project.

However, administration of the new system was fairly complex. A typical house was divided into 30 and odd components. Daily payment was insisted up on. In order to overcome the complexity in administration, the system was immediately computerised.

A New Method in Construction

During the second phase of construction, various new methods were considered to speed up the project. One of the methods adopted was allotting materials to the beneficiary families and encouraging them to arrange labour and organise construction. Of course, the construction was done as per the design agreed upon and under the technical supervision of the SIFFS team. In all 36 houses were constructed through this method, the salient features of which are summarised below.

- The beneficiary family had to have three cents of land with title deed (patta).
- Design of the house was finalised through the ‘face to face’ process as in other cases.
- SIFFS issued materials, unloaded at the sites, as per the finalised drawings and estimates.
- SIFFS provided water, centring materials, and engineering support.
- The family had to arrange labour and pay the labour charges, which were reimbursed by SIFFS on completion of construction and measurement, as per norms.

While structural changes were not allowed, beneficiaries were permitted to customise within the overall framework of the design, provided they met the additional labour and material costs wherever applicable.

Construction Management System

SIFFS Board of Directors entrusted the overall supervision of the project to a Project Steering Committee. The Committee met at regular intervals and provided directions to the project. The implementation team was headed by a Project Manager. There was a Project Management Committee consisting of experts that advised the Project Manager. Assistant Project Manager supported the Project Manager in managing the team,
interactions with the community, and the interface with the district administration. A diagram showing the construction management system is provided in Annexure 10.

The construction projects were managed by a completely computerised system using a software application developed specifically for the project. The entire gamut of activities ranging from inventory management to accounting had been computerised. Tally was used for accounts management, which was linked to the other software application.

The following departments looked after the construction process.

- Engineering and architecture
- Administration and monitoring
- Stores (Inventory management)
- Purchase

- Accounts
- Vehicles and machineries
- Quality control
- Community development (Also called the Social team)

Each department was headed by an experienced person and all important decisions were taken in the meetings of the heads of departments.

Procurement and inventory management systems were maintained with a high level of transparency and accountability. Once the requirement of an item in stock was reported, the process started with generating a demand note through processing of purchase order, taking the material in stock and issuing note for making payment, till the payment process was completed through the system using checks and approvals at various levels. The
system allowed monitoring to the level of physical movement of even the smallest components.

A spreadsheet based system was in place for day-to-day monitoring of progress. The system was maintained in such a way that the team was able to know the progress of work on each house under construction at the end of the day.

Interfacing the community leadership for the implementation of the project was a task that required continuous effort. The team had been able to manage it well, in spite of occasional conflicts and problems. The traditional panchayat actively involved in the project. The SIFFS team managers were invited to the panchayat meetings to sort out project-related issues. Similarly, panchayat representatives participated in meetings called by the Project Manager whenever there was a requirement.

Interfacing with the Government had been a regular requirement of the project. The district administration had a monitoring system in place, chaired by the district collector. There were regular meetings at the collector’s office to evaluate the progress. There had been continuous pressure from the district administration to speed up the project. Project Manager, Assistant Project Manager and other senior members of the team participated in the meetings called by the district administration. In addition, senior officers of the state Government visited the project at regular intervals.

SKAT had been providing technical advice and support to the project. SIFFS had put in place systems for timely reporting of the progress of the project to various partner agencies.

**Quality of Construction**

Reinforced cement concrete structures need a lot of care in construction and maintenance especially in a coastal environment. If the quality of construction cannot
be ensured, the maintenance of these structures over a period of time can become a serious issue. Due to the large number of constructions taking place in the tsunami affected areas and the resultant scarcity of labour, ensuring the quality of work became exceedingly difficult. It was, therefore, essential to train house owners and overseeing teams in the monitoring of construction.

A number of training programmes were organised in this connection - training on quality of construction for field staff and engineers, quality control training to house owners, and training of local masons to work with ferro-cement and rammed earth masonry (by Hunnarshala, Gujarat) were among them.

The training programme for house owners covered safety aspects, importance of quality in construction, quality of materials, technical aspects of concreting, brickwork, plastering, flooring etc., and house owners’ role in the quality of construction.

One of the model houses was constructed using rammed earth masonry in order to offer an alternative in building materials. However, the choice of selecting building materials was left to the house owners. One of the objectives of training local people in masonry and related work was to generate options for alternative employment in addition to making a work force available at the construction site.

A group of women who were trained in making ferro cement tanks initially took up grill production for parapets of the houses when such a demand came up. They were given training in grill production. A group of six women, a male mason and helper continued grill making as a small business throughout the construction project. They made all the grills used for the house parapets. The group may be able to sustain its business even beyond the SIFFS construction project.
The project team had material testing equipment in place for ensuring the quality of sand, bricks, and concrete. A separate team was there initially for quality management. This was later merged with the engineering team.

A comprehensive and step-by-step construction manual was developed as a handbook for project staff and supervisors. It is a reference document of guidelines which complemented the instructions given by the technical team.

UNDP Shelter Advisory Group had been making periodic visits to the project in order to keep a watch on quality of construction. In its feedback and recommendations, the group has expressed satisfaction over the quality of construction in the SIFFS project.

**Sanitation**

The socio economic survey showed that the house owners in Tarangambadi and Chinnangudi were, traditionally, not users of enclosed toilets. Although the structural provision for toilets had been made, there were some issues that SIFFS had to address. Incorporating toilets in the houses would imply expecting first generation users to start using them. Further, the water table in the region was high; therefore, the sanitation mechanism introduced had to protect the ground water from contamination. During the construction phase, the amount of water that would be available to every family in future was uncertain. This had implications for the choice of sanitation technology.

An IEC campaign on environmental sanitation was initiated in November 2006 covering both the villages in the context of the habitat project. The primary objective of the campaign was to build awareness on issues relating to drinking water and sanitation. The campaign was visualised in such a way that it would also prepare the communities to use sanitary latrines, considering the fact that the vast
majority of the people of these villages had no experience in using latrines. It was also prompted by the endemic incidence of water-borne diseases and the poor state of solid and liquid waste management as seen in existing villages in general and temporary shelters in particular.

Multiple campaign methods relevant to the local context were used in the campaign for communicating the required messages. These included group meetings, community meetings, children’s meetings, cultural programmes, film shows, participatory exercises for premises cleaning etc. The salient features of the campaign were as given below.

- A base line census survey on environmental sanitation was designed, the conduct of which continued throughout the campaign period, and worked as the chief carrier of messages to the families.

- Each survey team included three members, two women and a man.

- The survey team was given training in the strategy, methodology and components of the campaign. Special training sessions were organised to train the survey team in administering the schedules. Pilot surveys were conducted. During the pilot survey, flaws in administering the schedules were identified and rectified. The teams went through a final training session in order to fine tune the survey process. Special emphasis was placed on equipping the team members to use administration of the survey schedule as a means of building rapport with the families so that they could be encouraged to participate in the campaign and action. A system was put in place to check the quality of data collected regularly and to effect corrective mechanisms in case of doubts on the veracity of the data collected.

- Survey teams were asked to hold meetings of the day’s respondents in the evening every day in order to discuss a set of issues relating to water and sanitation. They were also asked to organise weekly meetings of all the respondents covered during the week and their families.

- Effort was taken to ensure the cooperation of local NGOs and their SHGs for the campaign.

- Micro level actions for cleaning the premises were organised regularly as demonstration on solid waste management.

- Regular feedback sessions were held with the survey teams and follow up training programmes were conducted to strengthen their capabilities in educating the people on issues relating to water and sanitation. A special training programme on water borne diseases was organised in a...
participatory manner, which had a positive impact on the quality of the campaign.

- A software application was developed for data entry. Data entry was carried out along with the survey, so the results could be consolidated immediately.

The campaign reached a high pitch during the event that marked the handing over of the first set of houses to the community in Tarangambadi. The team took up the responsibility of initiating the people to use the community toilets that were provided as an interim arrangement till household sanitation systems are in place.

A follow up campaign had been proposed to educate the people on the use and maintenance of household latrines and for improving their hygiene behaviour.

**Monitoring**

Monitoring of the habitat reconstruction project was undertaken by a number of stakeholders: the administration, house owners, representatives of cluster committees and cluster volunteers on the one hand, and SIFFS through its own monitoring mechanisms on the other. Transparency was maintained in all dealings and progress status was available for the community on demand. Through weekly meetings the district administration kept a close watch on the progress of tsunami rehabilitation work of all organisations, including SIFFS. The meetings were attended by the District Collector, Tehsildar, Engineer, Executive officer of the elected panchayat and town panchayat representative. The engineer made periodic visits to monitor progress and report to the collector.

For the larger community of donors, well-wishers and interested persons, SIFFS maintained a detailed and updated set of documents on its website specially created for the reconstruction project. The status of construction was available by date on this website. The other documents that could be accessed were the following.

- Profile of clusters
- Socio-economic and family details of every household
Project Financing

The SIFFS habitat reconstruction project was funded by the following agencies.

- Swiss Solidarity (SwS) and Swiss Red Cross (SRC), the largest funding partners for the project, supported 1000 houses in Tarangambadi and Chinnangudi. In addition to funding support, SRC had also brought in technical and managerial support to the project, which are explained subsequently in the document. SRC had been a funding partner to SIFFS in livelihood projects during the post tsunami rehabilitation phase.

- terre des hommes, Germany, a partner that had supported SIFFS through three livelihood support projects for the post tsunami rehabilitation programme provided funding support to 100 houses in Chinnangudi.

- Philips Electronics India Limited, the sole corporate sector partner in the project, supported the construction of 175 houses. In addition, Philips also supported SIFFS in installing energy efficient lighting systems in the new settlements. Philips had been a funding partner for other post tsunami projects of SIFFS as well, including the construction of a multi storied building for the school in Tarangambadi.

- Christian Aid (CA), UK, a DEC partner, had also supported the SIFFS habitat reconstruction project in Kanyakumari district in addition to the one in Tarangambadi. CA had earlier supported a livelihood rehabilitation programme covering Kanyakumari and Nagapattinam districts of Tamil Nadu.

Among the partners supporting the project, SRC had a major role in construction management and quality control. While Initiatives In Development Support (IIDS) provided project management and monitoring support, SKAT looked after the technical aspects including quality of construction.

Table 1 shows the funding participation of the partners in the project.

SKAT Mission

There had been quarterly visits of SKAT Mission to support the construction project. The technical back stopping that SKAT provided to the project had been very effective, compensating to a large extent for SIFFS’ lack of experience in habitat projects.
In addition to providing technical and monitoring guidance, SKAT also supported SIFFS in setting realistic targets in the different phases.

Roads, Electrification and Lighting

The Government laid asphalt topped roads along the streets of the new habitats. Electrification of the village was done by the State Electricity Board. Street lights had been provided. The compact fluorescent lamps (CFL) supplied by Philips Electronics enhanced the pleasant ambience of the houses during evenings, in addition to saving energy in lighting. Each house had been provided with a couple of 19W CFLs and a 40W fluorescent tube light.

School Building

Tarangambadi has a hundred-year-old school that has played a central role in the culture and development of the region. As part of the habitat reconstruction project, SIFFS constructed a three storied building for the school. This proved useful to the school as it had been struggling to accommodate all the facilities within the limited space available. The project was funded by Philips Electronics. The school may utilise the additional space available for vocational training programmes for girls.

Follow up Project

The SIFFS project office would continue for a year beyond project completion to look after the maintenance of new structures. SRC has already initiated a post construction project in the areas of health and hygiene, water and sanitation, solid waste management and maintenance of facilities. The Government of Tamil Nadu is expected to install a sewerage treatment system in Tarangambadi. In addition, the government is also planning to take up projects in water supply schemes, drainage, and retaining wall.

Challenges

For SIFFS, a fishermen’s organisation, this was the first foray into construction. The organisation took on the challenge armed with

<table>
<thead>
<tr>
<th>Village</th>
<th>Community</th>
<th>Funding Support</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SwS/SRC</td>
<td>Tdh(G)</td>
</tr>
<tr>
<td>Chinnangudi</td>
<td>Fishing</td>
<td>113</td>
<td>100</td>
</tr>
<tr>
<td>Karanteru</td>
<td>Dalit</td>
<td></td>
<td>22</td>
</tr>
<tr>
<td>Puthuppalayam</td>
<td>Dalit</td>
<td></td>
<td>45</td>
</tr>
<tr>
<td>Tarangambadi</td>
<td>Fishing</td>
<td>887</td>
<td>27</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1000</td>
<td>100</td>
</tr>
</tbody>
</table>

Notes:

SwS/SRC: Swiss Solidarity- Swiss Red Cross, Tdh(G): Terre des hommes (Germany)
CA: Christian Aid UK, PEIL: Philips Electronics India Limited
NA: Funds not available

<table>
<thead>
<tr>
<th>Village</th>
<th>Community</th>
<th>Funding Support</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SwS/SRC</td>
<td>Tdh(G)</td>
</tr>
<tr>
<td>Chinnangudi</td>
<td>Fishing</td>
<td>113</td>
<td>100</td>
</tr>
<tr>
<td>Karanteru</td>
<td>Dalit</td>
<td></td>
<td>22</td>
</tr>
<tr>
<td>Puthuppalayam</td>
<td>Dalit</td>
<td></td>
<td>45</td>
</tr>
<tr>
<td>Tarangambadi</td>
<td>Fishing</td>
<td>887</td>
<td>27</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1000</td>
<td>100</td>
</tr>
</tbody>
</table>
the conviction of applying an appropriate mix of scientific intervention and sensitivity in providing space for house owners’ voices and opinions. SIFFS invited expertise and competencies from around the world and integrated them with communities’ perspective and the organisation’s experience of working with fisher folk for over 25 years. The issues and challenges that the habitat construction process faced had been many.

Creating space for all stakeholders to voice their opinion had necessitated resolving conflicting demands – the administration wanted speedy delivery, the community wanted immediate resolution of conflicts, observers sought strict adherence to quality standards. Further, introducing a social perspective in the minds of the technical team was met with some difficulty.

The most important issue facing SIFFS had been the delay in handing over houses. There were various reasons for the delay.

- The initial land filling work had been time consuming, causing delays early in the project.
- Customising houses to meet individual needs was a time consuming process.
- There was a shortage of quality labour-force in the region due to the sudden upsurge in construction work after the tsunami.
- Negotiation with service providers had sometimes been difficult and long-drawn.
- There were many teething problems arising out of SIFFS’ lack of experience in construction work.

At the time of handing over the first set of 451 houses to the community, SIFFS conducted a sample survey among the house owners to get feedback on various aspects of the habitat programme, including details of houses.
Immersed in the construction process as they were, and confronting various issues raised by the people and the panchayat on a day-to-day basis, it was difficult for the team to guess what people really felt about the project and the houses. The feedback was reassuring, a feeling of ownership was evident in the response. This was reinforced further by the immediate and total and full occupancy of the newly constructed houses.

The way people occupied their houses, and in fact, took over the new habitat, and the way they have extended and improved their living spaces, stand testimony to the ownership feeling generated through the participatory approach. The decision to involve the people in the design process, thus making it clear that SIFFS refused to see the project as mere provision of houses and that it insisted on delivering a habitat reconstruction project by recognising the rights of the poor too to have choices, and also acknowledging the fact that every family had its own needs in housing; and the allotment of plots before construction that triggered unprecedented levels of people's participation had been instrumental in creating this ownership.
ANNEXURES
Annexure 1
Inundation Map - Chinnangudi

LEGEND

No risk area
Low risk area
Medium risk area
High risk area

INDATIONUN MAP FOR 2.25M WATER LVL
Annexure 2
Habitat Maps
SIFFS' POST TSUNAMI HABITAT RECONSTRUCTION PROJECT

HABITAT MAPPING FOR CHINNANKUDI VILLAGE
EXTENT OF DAMAGE

PLOT AREA DISTRIBUTION

DAMAGE BEFORE TSUNAMI (MAJOR)
DAMAGE BEFORE TSUNAMI (MINOR)
DAMAGE AFTER TSUNAMI (MAJOR)
DAMAGE AFTER TSUNAMI (MINOR)
NO DAMAGE
HABITAT MAPPING FOR CHINNANKUDI VILLAGE
SOUTHインドIAN FEDERATION FOR FISHERMEN SOCIETIES
HOUSE TYPE

REBUILDING HABITATS: PROCESS DOCUMENT
SIFFS' POST TSUNAMI HABITAT RECONSTRUCTION PROJECT

LEGEND
< 3 CENTS -
> 3 CENTS -

PLOT AREA DISTRIBUTION
HABITAT MAPPING FOR THARANGAMBADI VILLAGE
SOUTH INDIAN FLUIDRATION FORT ISHLRMLN SOGILILS

North
SIFFS' POST TSUNAMI HABITAT RECONSTRUCTION PROJECT

LEGEND

<325 SQ FT - <3 CENTS
<526 SQ FT - >3 CENTS
>126 SQ FT - >3 CENTS
>326 SQ FT - >3 CENTS
VACANT PLOT
INACCESSIBLE

PLOT & PLOTS AREA COMPARISON
HABITAT MAPPING FOR THARANGAMBADI VILLAGE
SOUTH INDIAN FEDERATION FOR FISHERMEN SOCIETIES

North
Annexure 3
Habitat mapping – Chinnangudi, results summary

Chinnangudi

- The original site of habitation in the village was at an elevation.
- Houses constructed near the Amman river were on a raised plinth.
- There is a need for space on the beach for beaching craft and nets and for the building of homes close to the beach/landing area.
- Spaces in front of homes are used for various livelihoods related activities such as drying nets and fish.
- Auctioning, done by women, is carried out on the beach during the day. The catch which arrives at night is auctioned under streetlights.
- The pooja room always faces east.
- Women also face east while cooking in the kitchen which is usually separated from the main portion of the house.
- The front and rear doors of the house are aligned in a straight line.
- Storage space is at premium for both, household goods and livelihood related articles and among them, storage of firewood and water is of great importance.
- Some families have poultry and goats.
- Attached toilets are rare, but there is an increasing demand for them especially from women.
- Although the community would like individual houses, they asserted that their social life unfolds on the streets and pathways in the village.
- While the villagers wanted all streets to be navigable by motorized transport, three streets in the new layout had to be extra wide to accommodate processions associated with the village festivals.
Annexure 4
To move or not to move
Annexure 5
Lay outs
New Location, In-situ Construction, Repairs
Annexure 5.1
Cihhangudi New site layout

CHINNANGUDI NEW SITE LAYOUT - 2

- CNUB: 36 NOS
- CN17: 39 NOS
- COMMON SPACE
- POND
- ROAD
- TOTAL NO OF PLOTS - 74 NOS
Annexure 5.2
Cihhangudi New site layout

CHINNANGUDI NEW SITE LAYOUT 1

PLOT SIZE = 8 M X 15 M
PLOT AREA = 3 CENT
TOTAL NO OF PLOTS - 108 Nos

- CLUSTER A - 3 NOS
- CLUSTER B - 8 NOS
- CLUSTER C - 9 NOS
- CLUSTER D - 9 NOS
- CLUSTER E - 8 NOS
- CLUSTER F - 9 NOS
- CLUSTER G - 9 NOS
- CLUSTER H - 8 NOS
- CLUSTER I - 9 NOS
- CLUSTER J - 10 NOS
- CLUSTER K - 8 NOS
- CLUSTER L - 8 NOS
- CLUSTER M - 10 NOS
- ROAD
- COMMON SPACE
Annexure 5.3
Puthupalayam and Karan Street Layout
Annexure 5.4
Meenavar Colony Layout
Annexure 5.5
Tharanganbadi New Site Layout
Annexure 6
Drainage map of Tharanganbadi
## Model Houses - Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>Building area</th>
<th>Toilet/Bath</th>
<th>Kitchen</th>
<th>Pooja room</th>
<th>Extension possibility</th>
<th>Staircase</th>
<th>Veranda</th>
<th>Rainwater harvesting from the roof</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>396.5 sq ft</td>
<td>Attached</td>
<td>Attached</td>
<td>East facing</td>
<td>Front and test floor</td>
<td>Outside</td>
<td>No</td>
<td>Yes</td>
<td>-</td>
</tr>
<tr>
<td>II</td>
<td>340 sq ft</td>
<td>Detached</td>
<td>Detached</td>
<td>East facing</td>
<td>Front and test floor</td>
<td>Outside</td>
<td>No</td>
<td>Yes</td>
<td>Front</td>
</tr>
<tr>
<td>III</td>
<td>291.4 sq ft</td>
<td>Attached</td>
<td>Attached</td>
<td>East facing</td>
<td>Front and first floor</td>
<td>Outside</td>
<td>No</td>
<td>Yes</td>
<td>Front</td>
</tr>
<tr>
<td>IV</td>
<td>276.17 sq ft</td>
<td>Attached</td>
<td>Attached</td>
<td>West facing</td>
<td>Front and first floor</td>
<td>Outside</td>
<td>No</td>
<td>Yes</td>
<td>Front</td>
</tr>
<tr>
<td>V</td>
<td>263 sq ft</td>
<td>Attached</td>
<td>Attached</td>
<td>East facing</td>
<td>Front and first floor</td>
<td>Outside</td>
<td>No</td>
<td>Yes</td>
<td>Front</td>
</tr>
</tbody>
</table>

**Model Houses - Summary**

- **I**: 396.5 sq ft, Toilet/Bath Attached, Kitchen Attached, Pooja room Attached, Extension possibility Front and test floor, Staircase Outside, Veranda No, Rainwater harvesting from the roof Yes, Others -
- **II**: 340 sq ft, Toilet/Bath Detached, Kitchen Detached, Pooja room Front and test floor, Extension possibility Outside, Staircase No, Veranda No, Rainwater harvesting from the roof Yes, Others Front
- **III**: 291.4 sq ft, Toilet/Bath Attached, Kitchen Attached, Pooja room East facing, Extension possibility Front and first floor, Staircase Outside, Veranda No, Rainwater harvesting from the roof Yes, Others Front
- **IV**: 276.17 sq ft, Toilet/Bath Attached, Kitchen Attached, Pooja room Attached, Extension possibility West facing, Staircase Outside, Veranda No, Rainwater harvesting from the roof Yes, Others Front
- **V**: 263 sq ft, Toilet/Bath Attached, Kitchen Attached, Pooja room East facing, Extension possibility Front and first floor, Staircase Outside, Veranda No, Rainwater harvesting from the roof Yes, Others Front
- **VI**: 243 sq ft, Toilet/Bath Attached, Kitchen Attached, Pooja room Attached, Extension possibility East facing, Staircase Outside, Veranda No, Rainwater harvesting from the roof Yes, Others Front
Annexure 8
Drawings of various house options
SIFFS’ POST TSUNAMI HABITAT RECONSTRUCTION PROJECT

GROUND FLOOR PLAN

FIRST FLOOR PLAN

All Dimensions are in MM

S. No. | Description | Date | Drawn
--- | --- | --- | ---
1 |  |  | 
2 |  |  | 
3 |  |  | 
4 |  |  | 
5 |  |  | 

Joinery Schedule

- D1 900X2000
- W1 1100X1200
- W3 600X1200
- V 900X600

Project: HOUSING SCHEME AT THARANGAMBADI

Clients: SOUTH INDIAN FEDERATION OF FISHERMEN SOCIETIES

Particulars of the Drawing:

FLOOR PLAN OPTION - 3

Scale: Full Scale

Drawn Date: 23-06-2005

Issued Date: 25-06-2005

Drawn: A. P. Anbumani

PROJECT MANAGER: M. Liby T. Johnson
Annexure 9

SIFFS Reconstruction Project – Monitoring Process Flow Chart