

Post disaster Housing Reconstruction: Comparative Study of Donor Driven vs. Owner Driven Approach

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Abstract

Besides human casualties one of the most visible and striking effects of any major disaster is the destruction of houses. Construction of houses will be a major activity in the reconstruction phase of a disaster. The quickest and the most effective way to rebuild houses after a disaster is to employ what is known as the “Donor Driven” approach. In this approach the government or an external agency who is funding the project will lead the reconstruction process with the help of consultants and contractors procured for the project. The major limitation of this approach is that it may lead to housing that does not respond to the need of the victims. As an alternative, the so called “Owner Driven” approach has been used by some donor agencies as well as the government in many disaster situations. In this approach the disaster victims reconstruct their houses by themselves. The role of the external agencies is limited to the provision of financial and technical assistance.

Past research on the suitability of these two approaches to various disaster situations is limited to very few cases. The massive reconstruction programme implemented in Sri Lanka after the Indian Ocean Tsunami has used both these methods with varying degrees of success. Therefore, lessons learned in Sri Lanka would be a useful contribution to this growing body of literature on different approaches to post disaster housing reconstruction.

This paper aims to contribute to this discussion through a questionnaire survey conducted among beneficiaries of Tsunami housing programmes in the Matara District of Sri Lanka. The study found that Owner Driven approach has a number of advantages over Donor Driven approach. Nevertheless, Donor Driven approach cannot be totally dismissed as unsuitable because it has scored very high on some important parameters that are relevant for disaster situations.

Key Words: Disaster reconstruction, Housing, Sri Lanka

1. Background

Disasters cause a substantial amount of damage around the world every year [7]. In recent years several major disasters have occurred in coastal areas worldwide. On the 26th of December 2004, a major Tsunami occurred in the Asian region killing nearly 250,000 people around the

Indian Ocean. The Joint Report of the Government of Sri Lanka and Development Partners[3] issued in December 2005 highlights that the Tsunami on 26th December 2004 killed 35,322 people and destroyed US \$ 900 million worth of assets and infrastructure in Sri Lanka.

One of the major challenges after a disaster is how the redevelopment activities should be undertaken. To rebuild the nation after a disaster, Governments adopt different reconstruction strategies. Different reconstruction strategies give different outcomes. Serious decisions must be made on how risks could be reduced to acceptable levels and these decisions have to be reflected in the reconstruction and recovery strategies that should be adopted. Identifying the most suited and applicable strategy for each situation is of utmost importance in order to provide better assistance to the victims and to avoid possible future vulnerabilities and environmental degradation.

Therefore, the aim of this research is to analyze the strategies used in post Tsunami reconstruction work in Sri Lanka. The main objective of the research is to identify the post Tsunami housing reconstruction strategies used in Sri Lanka, their applicability to Sri Lankan context and their successfulness.

2. Disaster Management & Reconstruction

2.1 Disaster management

Disasters are not totally discrete events. Their possibility of occurrence, time, place and severity of the strike can be reasonably and in some cases accurately predicted by technological and scientific advances. It has been established that there is a definite pattern in their occurrences and hence we can to some extent reduce the impact of damage though we cannot reduce the extent of damage itself. This demands the study of disaster management in methodical and orderly approach [5].

Disaster management has different emphasis in different disciplines. According to Central Emergency Relief Organization [2], disaster management is a collective term encompassing all aspects of planning for and responding to disasters, including both pre-disaster activities and post-disaster activities. It may refer to the management of both the risks and consequences of disaster.

Disaster management can be divided into four steps as: Emergency Response and Relief; Recovery and Reconstruction; Mitigation; and Preparedness [8].

2.2 Reconstruction Strategies

According to Kishore [6], any reconstruction programme has to meet a range of complex and often conflicting needs of affected people. i-Rec Conference held in 2004, has identified that reconstruction programmes often fail to take in to account the desires of disaster affected populations. If proper attention is not given to needs of affected people there is a possibility that the newly constructed facilities become obsolete from the day the construction is complete.

Therefore, reconstruction strategies should be implemented after studying the desires of the affected people.

According to Asian Disaster Reduction Center[2], post disaster reconstruction is a complex issue with several dimensions. Government, non-governmental and international organizations have their own stakes in disaster recovery programmes, and links must be established among them, as well as with the community. SMEC Group of Companies [8] mentioned that, reconstruction is one of the most demanding forms of activity after a disaster, because it operates in conditions of uncertainty, often in remote locations and within severe time constraints. Therefore, proper planning is of utmost importance to reduce future vulnerabilities and to improve long-term sustainability. A good housing reconstruction strategy will take in to account the social need together with long-term disaster mitigation and sustainability. Barenstein [9] has studied these strategies following the earthquake that hit Gujarat in India on 26 January 2001. Barenstein [9] identified five approaches, namely; the owner-driven approach; the subsidiary housing approach; the participatory housing approach; the contractor-driven approach in situ; and the contractor-driven approach ex nihilo, that have been used during the reconstruction. The author has compared these five approaches and discussed the issues related to implementation of each of these methods.

Indian Ocean Tsunami provides an opportunity to study the different approaches used in housing reconstruction, their success, and related issues. According to Wegelin [10], Indonesia's Reconstruction Master Plan for post Tsunami reconstruction set two core standards for tsunami victim household support. Each surviving household would be entitled to a grant of US\$3,000 per house to rebuild the houses if it needed to be rebuilt from scratch and US\$1,000 for damaged houses that could be renovated. Unlike in Gujarat, Sri Lanka used only two distinct approaches in housing reconstruction. They are, Donor Driven approach and Owner Driven approach [10].

Donor Driven reconstruction program is completely handled by the donor agencies as relocation of affected families within the buffer zone from the buffer zone became a necessity. All affected families were entitled to a house built by a donor agency in accordance with Sri Lankan government standards in a new location. In addition, the donor provides all common infrastructure for the new settlement, while Sri Lankan government provides the services up to the relocation site [10].

Houses got damaged partly or fully outside the buffer zone were included in the Owner Driven reconstruction program. The Sri Lankan government provided a cash grant to the affected homeowners for the reconstruction of their houses at the same site. The owner of a partly damaged house received a cash grant of Rs.100,000 and the owner of a fully damaged house received a cash grant of Rs.250,000 [10]. The Owner Driven approach enables the affected communities to undertake construction work by themselves with external financial support and technical assistance.

3. Methodology

First a comprehensive literature review has been carried out on disaster management and reconstruction strategies by referring books, reports, journals and research publications. The Tsunami, which hit Sri Lanka on the 26th of December 2004, has been selected as the case study for this research. A detailed documentary survey has been carried out on post-Tsunami reconstruction activities in order to identify the different housing reconstruction strategies adopted. Also 100 newly constructed or repaired houses have been inspected in the District of Matara in order to get a clear idea on issues such as buildability, sustainability, etc.

Both structured and unstructured interviews were conducted among officers of 11 Governmental and 6 non-Governmental Organizations, to collect information on post Tsunami housing reconstruction strategies, their suitability and applicability. A questionnaire survey has been administered among 531 Tsunami victims in the District of Matara, to identify the beneficiary satisfaction of the housing they obtained. The profile of the sample used in the questionnaire survey is given in Table 1.

Table 1: Profile of the sample

Category	No. of Dwellers	%
Donor Driven Housing Relocation Programme	261	49 %
Owner Driven Housing Resettlement Programme	255	47 %
Received only Temporary Housing	21	4 %
Total	537	100%

4. Results

With all findings from questionnaire survey, unstructured interviews conducted among Tsunami victims together with observations of the researcher and the views of officers of the relevant Governmental and Non Governmental Organizations, the successfulness of the housing reconstruction programme has been measured separately for Donor Built Programme and Owner Driven Programme using the parameters given below.

- Coverage
- Adequacy and sufficiency of the relief received
- Timeliness
- Overall satisfaction of the victims
- Other issues based on the observations of the researcher (Buildability, Sustainability, Extendibility)

4.1 Coverage

According to statistical details 74.30% of the housing units have been completed and 18.63% of the housing units are been progressing by September 2007 [11]. So the tsunami housing reconstruction progress in Sri Lanka is in fairly success stage when considering total planned duration of 3-5 years period. Beyond the above facts, the present housing coverage in Matara district has been concluded in following topics under two housing reconstruction strategies in order to identify the successfulness of the housing reconstruction programme.

In the case of donor driven housing programme in Matara district that total 62 numbers of sites assigned for relocation and out of that 48 numbers of sites have been completed. Although the 10 sites are currently in progress and 08 numbers of sites are not commenced yet. When concerning the total number of houses required for district of Matara has planned as 1678 units and already 1856 housing units have been completed. Also 371 housing units are in progress and 423 houses are not begun as it planned at the decision making stage. So as a conclusion it can be mentioned as more than 100% of total housing requirement has been achieved at the moment in donor driven housing programme in Matara district with an excess of 178 numbers of housing units [11].

Up to end of September 2007 that 96.70% of total number of housing unit in overall fully and partly damaged housing unit in owner driven housing programme has been completed in the district of Matara. So the remaining 2.7% is on progress and 0.6% of housing units are not begun yet. In the case of owner driven housing programme the housing progress in fully and partly damaged housing units are summarized in separately as following Table 2.

It can be seen in the 89% of completion in fully damaged houses and 99% of completion in partly damaged houses. So the money disbursements do not inevitably denote that the reconstruction of the housing units are completed from Rs. 250,000/= is given to fully damaged victims in 4 installments and Rs. 100,000/= is given to partly damaged victims in 2 installments. It has been observed when the dwellers have failed to show the progress of the work with in the stated requirements, and then the victims have been unable to collect the next installment according to disbursement schedule. So that they had to wait for further money arrangement from top up grants, loans and other assistances from third parties to complete their houses and that has affected a fairly less progress in owner driven housing programme especially in fully damaged houses.

Table2: Progress in Owner Driven Housing Programme

	Fully Damaged Houses		Partially Damaged Houses	
	Nr. Of Houses	%	Nr. Of Houses	%
Completed	1250	89%	4821	99%

In Progress	142	10%	25	0.50%
Not Started	11	1%	25	0.50%
Total	1403	100%	4871	100%

4.2 Timeline

To carrying out the research in several parameters that the scale has been used as “very satisfied”, “somewhat satisfied”, “somewhat dissatisfied”, and “very dissatisfied”. As shown in Table 3, the greater parts of the victims were at either categories of “somewhat dissatisfied” or “very dissatisfied” scales in both housing reconstruction programme. It is not an uncertainty issue due to that reconstruction has been designed to complete within 3-5 years of timeframe and still it has only taken nearly 3 years.

Furthermore, when concern about the views of the victims on the timeliness of the delivery of permanent houses that the Table 3 shows a fairly satisfied response to owner driven housing programme when compared to donor driven houses. In the case of owner driven programme has taken less time to arrange the financial assistance and other aspects but donor driven programme has get more time than owner driven due to acquire lands, design, contractual arrangement and construction in the whole procedure due to large scale of housing projects.

Table3: Satisfaction level regarding Completion Timeline

Reconstruction Strategy	Very Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Very Dissatisfied
Donor Driven	0%	7%	42%	51%
Owner Driven	5%	25%	43%	27%

4.3 Dwellers view on their permanent residence

One of the most visible and outstanding effects of any major disaster is the devastation of houses which destroys livelihoods, protection and privacy. So that, without framing to the timeline and cost of the reconstruction activities it is essential to evaluate the dwellers’ views to gain an overall satisfied output. Under this heading, the dwellers’ views were gained on their permanent residences while covering the nine salient factors and condition generally assemble with housing programmes in both donor driven and owner driven, which are mentioned at the

beginning of this chapter. Although the scale used was the previous one used in the above that “very satisfied”, “somewhat satisfied”, “somewhat dissatisfied”, and “very dissatisfied”.

4.4 Quality / Strength / Durability

As shown in Table 5, in the case of donor driven programme, only 5% of the dwellers were very satisfied and 15% were somewhat satisfied while 47% were somewhat dissatisfied and 33% of the dwellers were very dissatisfied. Due to much more reasons are behind that and the dwellers were not satisfied with strength, arrangement of structure, quality of material used, improper land fillings and cuttings and dreadful manner of construction of the houses. Alos due to increament of intermediate dealers, in each transactions have end resulted to minimize the amount of money for single housing unit. Finally that has affected to carry out contractors’ duty in less cost target, which reflected to select low cost and poor quality materials, offensive method statements, etc. By the way most observed projects are with small to sever defects and some houses are taken leave off. In most case the dwellers involvement to construction activities was less and that 5% of very satisfied has succeeded due to the dwellers participation.

Throughout the survey result 55% of the dwellers of the owner driven programmes were very satisfied and 34% were somewhat satisfied. Dwellers in owner driven houses argued that high level of quality standards can be achieved when the inception to completion is done with participation of the resident. Most often the owners have recognized that better design and structural stability with superior quality maintenance of their newly residences is well important to future vulnerability. Financial assistance gained from the state was reinforced by the top up grants provided by the private donors in most of owner driven programme and other than that further money recovered from loans, own money, relations and friends assistance, etc. So comparing the outcomes of the survey it should be noted that in the case of owner driven programme is in high position than donor driven programme in respect to quality, strengthen and durability of their permanent residences.

4.5 Functionality

In the case of functionality, according to Table 5 the majority of the donor driven programme (41%), was very satisfied and according to Table 6 majority of owner driven programme (52%), was somewhat dissatisfied. Most of deign in donor driven houses are done by the qualified architect by concerning the Sri Lankan culture with basic amenities. And some of international participant involvement caused to restrict that the local complimentary designs. It is a common intention when constructing a house by the owner that is tried to achieve better house in respect to present financial strength with basic amenities or less and remain part with further arrangements will be done in future after occupied. It is what that has been observed in most owner driven houses.

4.6 Space availability

According to the survey results, it has been recognized that equally fair distribution can be seen according to Table 5 in donor driven programme in the case of space availability, which depends on several aspects such as members in a family, livelihood pattern, living standards, etc. And according to Table 6 the majority of the owner driven programme (59%), was very satisfied due to most of dwellers have identified their requirements and well established it concerning the number of family members. Although most fully damaged houses in owner driven programme have been observed as two storied houses by providing better space in vertical arrangement. Inadequate financial gainers have constructed their houses with less amenities and allocating insufficient spaces, which has resulted 15% of dwellers in somewhat dissatisfied category.

4.7 Aesthetics

As shown in Table 5, the majority, which is 52% of the dwellers of donor driven programme were somewhat satisfied and 22%, were very satisfied. In the case of owner driven programme 31% of dwellers were somewhat satisfied and 34% were very satisfied while amounts of 34% were somewhat dissatisfied according to Table 6. In both cases, it has been observed that some of middle class people who were not satisfied as they lived in better appearance houses before the tsunami. In most of the cases, it has been identified that donors have got better appearance houses which were designed by the qualified architect. Also the most owners have designed their houses according to their concept with better appearance.

4.8 Flexibility to make any changes in the future

As shown in Table 6 & 5, the majority, which is 54% of the dwellers of the owner driven programmes, were somewhat satisfied and majority of donor driven programme which amounts to 56%, were somewhat dissatisfied with the case of flexibility to make any necessary changes in the future. It has been noted that most of the dwellers in donor driven programme do not have any intention to change it presently due to that the original deeds were still not handover to them and either allowable land area is not enough to do horizontal alignment or that the design is not concern the vertical alignment to further developments.

4.9 Agreeing to change the design as required

In the case of the agreeing to change the design as required too, in owner driven programmes 45% of the dwellers were somewhat satisfied and 33% were very satisfied, while donor driven programme 56% of majority were somewhat dissatisfied. Dissatisfaction of dwellers in the donor houses were high due to that involvement of victims in the design stage can not be seen throughout the survey, but only few of projects had been allowed to inspect their houses to victims in the construction stage that couldn't support to change the design. So as a conclusion it has been noted that owner driven programme is in high satisfactory level compared in it to donor driven programme in respect to the support given to change the design.

4.10 Land size

In the case of land extent, the majority of donor driven programme (47%) was very dissatisfied and the majority in owner driven programme (52%) was very satisfied. It has been observed that major part of people who have moved to donor driven houses were not satisfied as they lived with adequate size of land area before the Tsunami. But now the most of donor's housing area is from 6 to 12 perches and it is nothing when it compare with pre tsunami owned land. Also there were no ground areas to most donor driven houses, which have been granted multi storied housing schemes but with some common area to social works. It is obvious to seen that most part of the owners were in satisfied level regarding their previous land extend, but only few cases have been identified as restricted areas to construction activities because of the buffer zone concept.

4.11 Location

According to Table 6 & 5, the majority, which is 66% of the dwellers of the owner driven programmes, were very satisfied and majority of donor driven programme which amounts to 41%, were very dissatisfied with the case of location. Most of the people in the Matara district who were affected to the tsunami are occupied in fishery industry. And most of other's livelihood activities are based with the sea. So majority of owner and donor dwellers have responded as it as major opportunity to located as near as the sea. But some of middle class peoples in both owner driven and donor driven programme have been observed that the relocation in inside villages is better than the previous coastal location, considering social and cultural issues.

4.12 Overall facilities provided

(Electricity, Water connection and Sanitary)

As per the result of the survey it has been identified that the overall facilities are available in donor driven programme and owner driven programme are in better position, which are shown in Table 4 categorizing in to three basic services that are electricity, water connection and sanitary facilities.

Table 4: Services in the house

Services	Donor Driven		Owner Built	
	Nr. Of Houses	%	Nr. Of Houses	%
Water	246	94.25	253	94.12
Electricity	231	88.51	234	91.76

Sanitary	210	80.46	210	82.35
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If the above facilities are connected to both programmes in adequate manner, due to several reasons the dwellers satisfactions for those facilities are not parallel. According to Table 5 & 6, it shows the satisfactory level of two different housing programmes in the case of the overall facilities, which in owner driven programme 41% of the dwellers were very satisfied and 39% were somewhat satisfied, while donor driven programme 39% of majority were somewhat dissatisfied. It has been observed that at the beginning the facilities are connected to donor house, but it has been made grave malfunction outputs due to some issues, unexpected situations and conditions.

Furthermore Table 7 specifies the percentage of dwellers under each category on the two reconstruction programmes that the majority, which is 40% of the dwellers of donor driven programme were somewhat dissatisfied and 31% were very dissatisfied. In the case of owner driven programme 50% of dwellers were somewhat satisfied and 33% were very satisfied. So it is comprehensible that the dwellers, who were under donor driven programme were not happier with their permanent houses than the dwellers, who were under owner driven programme in the district of Matara.

Table 5: Satisfaction of the Dwellers – Donor Driven

Factors	Very Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Very Dissatisfied
Quality/ Durability	5%	15%	47%	33%
Aesthetics	22%	52%	23%	3%
Functionality	26%	41%	24%	8%
Space availability	20%	26%	29%	25%
Agreed to change the design as required	4%	18%	56%	22%
Flexibility to make any changes in the future	4%	23%	56%	17%
Location	16%	20%	23%	41%
Land size	6%	15%	32%	47%

Overall facilities provided	23%	28%	39%	10%
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Table 6: Satisfaction of the Dwellers – Owner Driven

Factors	Very Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Very Dissatisfied
Quality/ Durability	55%	34%	11%	0%
Aesthetics	34%	31%	34%	1%
Functionality	13%	26%	52%	9%
Space availability	59%	24%	15%	2%
Agreed to change the design as required	33%	45%	20%	2%
Flexibility to make any changes in the future	22%	54%	19%	5%
Location	66%	19%	13%	2%
Land size	52%	26%	20%	2%
Overall facilities provided	41%	39%	20%	0%

Table 7: Dwellers' Total Satisfaction regarding their Permanent Resident

Reconstruction Strategy	Very Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Very Dissatisfied
Donor Driven	12%	17%	40%	31%
Owner Driven	33%	50%	15%	2%

5. Conclusions

The recent increases in frequency and magnitude of natural disasters have raised issues of increasing vulnerability of communities. The impact in terms of human, structural and economic losses has risen in recent years. The reconstruction process has very much depended on the administrative, political, social, economic and cultural context that coupled with many other unforeseen factors will affect the speed and coverage of the recovery programmes. In order to derive a better conclusion, the research mainly focused on the successfulness of post tsunami housing reconstruction programme based on two strategies, namely, donor driven and owner driven.

Main outcome from this survey is that dwellers in owner driven housing programme is more satisfied than the dwellers in donor driven housing programme when concerning more parameters. In other word, it can be concluded as that owner driven housing programme is more successful than the donor driven programme concerning the dwellers' view. According to the research, it has been argued that the owner driven housing programme has been in prominent level in term of: Quality / Durability, Space availability, Flexibility to make any changes in the future, Agreeing to change the design as required, Land size, Location, Overall facilities provided (Electricity, Water connection and Sanitary). When looking at these parameters, which are superior in terms of owner driven, have proved that the dweller involvement throughout inception design to construction stage resulted better success in owner driven housing programme than those who were under the donor driven housing programme.

But contrast with the owner driven housing programme that the donor driven housing programme has been more superior in term of; Aesthetics and Functionality. Furthermore, it has identified those two main reasons behind that are, the donor houses have been designed by professional architects and most of the houses in the owner driven programme were half built and occupied with the intention of completing in the future.

Reconstruction process should be considered as development opportunities and should open the access of different types of innovative solutions. These innovations should lead to vulnerability reduction, and should enhance human and other activities security in long term. By providing buffer zone that the government has identified the vulnerable area in future disasters and it emphasized to categorized the post disaster housing reconstruction programme to the above discussed two strategies. By the way the donor relocation programme started later than owner resettlement programme, the progress at the district of Matara in the donor driven is fairly high compared to the owner driven. Comparing to other districts, the coverage in the both programmes in Matara district is high, but that dwellers' view on timeliness to delivery of permanent houses to the donor driven and compensation to owner driven house have been identified in less figure. And that is seriously shown in donor driven programme. Although, that have been found excess amount of donor driven houses at the present, still the victims are living in temporary houses. Also the assistance given to sub families' victims could be seen in erroneous manner and after 3 years back that most of the sub families still in the temporary house, when the excess amounts of donor houses are vacant.

It has also been observed that the dwellers' view on the State assistance throughout the housing reconstruction programme is fairly high in the owner driven houses, but view on the NGO assistance throughout the housing reconstruction programme have been fairly low compared to those donor driven ones.

By evaluating the overall information on the post tsunami housing reconstruction programme, the successfulness of the process as well as the victims' view of two different reconstruction strategies will be helpful to decision makers to get comprehensible idea regarding their applicability and drawbacks on both the programmes.

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