

Study on regional differences in permanent housing reconstruction process in Sri Lanka after the 2004 Indian Ocean Tsunami

Hideaki NAKAZATO and Osamu MURAO
Systems and Information Engineering University of Tsukuba

(Received for 31 May., 2007 and in revised from 30 Nov, 2007)

ABSTRACT

The Sumatra Tsunami crossed the Indian Ocean on 26th of December 2004 and damaged more than 90,000 houses in Sri Lanka. Following the tsunami, the Government decided to provide three types of houses for the victims (temporary shelters, transitional houses, and permanent houses) according to the stage of reconstruction. Most permanent houses were donated by non-government organizations on the sites supplied by the Government. However, there are regional differences among the affected areas. We conducted a field survey and interviews in the damaged area in November 2005 and March 2006 in the period when the permanent houses were under construction. This paper describes the reconstruction status, regional differences, and problems with regards to the reconstruction process in Sri Lanka.

1. INTRODUCTION AND OBJECT

The Indian Ocean Tsunami, which originated in Northern Sumatra on December 26, 2004, struck many countries in South and Southeast Asia, including Indonesia, Sri Lanka, India, and Thailand. In Sri Lanka, the country most affected after Indonesia, the Department of Census and Statistics (2005) reported that approximately 40,000 people were killed, and 96,000 houses in coastal areas were completely or partially destroyed as shown in Fig. 1 and Table-1. Fig. 1 shows the Divisional Secretariat Division¹ which indicates the housing damage. Two months after

the tsunami, the Sri Lankan Government announced reconstruction plans and programs for roads, railways, and infrastructure in the affected areas.

According to the Steering Committee (Ministry of Finance and Planning) (2005), 516,150 people were considered displaced after the tsunami, having lost their homes. Some victims were given emergency shelters by the government or non-governmental organizations (NGOs), but many were obliged to depend on their families or public facilities such as schools and community centers. The Government conducted a housing reconstruction program composed of three phases: emergency shelters, temporary housing,

Table 1 Number of affected houses

Source: Department of Census and Statistics (2005), Census of Persons, Housing Units and Other Buildings affected by the Tsunami, 26th December 2004



Fig. 1 Affected area

District	Affected houses
Ampara	21, 201
Batticaloa	17, 405
Colombo	6, 345
Galle	12, 645
Gampaha	1, 006
Hambantota	2, 541
Jaffna	6, 209
Kaluthara	6, 697
Kilinochchi	288
Matara	6, 554
Trincomalee	9, 374
Total	95, 965

and permanent housing; temporary houses were to be used as a bridge between emergency and permanent houses. This 3-step reconstruction process was necessary because of the vast number of houses affected by the tsunami and the lengthy amount of time that was predicted for the completion of reconstruction.

The Steering Committee (Ministry of Finance and Planning) (2005) announced that 51,000 temporary houses, 90% of the required total were constructed by November 2005, 11 months after the tsunami. At this time, the major task of the Government was shifting its efforts to the construction of permanent houses. However, long-term living in temporary housing causes mentally and physical stress to the victims (Serving Sri Lanka, 2005). It was therefore important that victims were able to return to their original homes or to obtain new permanent housing as soon as possible. Although the regulations stated that the provision of permanent housing should be equal for all victims in any affected area, regional differences in housing reconstruction programs were reported throughout Sri Lanka.

In recent years, a variety of disasters have occurred all over the world, and much attention has been paid to housing reconstruction after these disasters. It is useful to categorize the data on housing reconstruction in Sri Lanka to guide future recovery efforts. The large amount of damage in coastal areas is unique to tsunamis, and the relocation of victims from their residences is thus a major concern. Maki et al. (2003) observed that some victims were able to return to their original homes several years after the tsunami on Flores Island in Indonesia. Furthermore, Maeda et al. (2007) revealed that of the method of restoring settlements was quite different in Moratuwa and Hikkaduwa, the south west area of Sri Lanka affected by the tsunami. In the case of Sri Lanka, the relocation of affected people is also an important issue. This report first describes the housing reconstruction program in Sri Lanka, particularly permanent housing, and then compares the regional differences between the affected areas based on field surveys and interviews with government officials and residents of the affected areas. Finally, the reasons behind the regional differences in housing reconstruction are discussed.

2. SUMMARY OF TSUNAMI DAMAGE AND HOUSING RECONSTRUCTION

2.1 Summary of damage

The coast in 13 districts¹, comprising two-thirds of coastal Sri

Lanka, was severely damaged. **Fig. 1** and **Table 1** show the affected areas and houses, respectively. In **Fig. 1**, it is apparent that areas such as Ampara, Batticaloa, and Trincomalee, with political turmoil and small-scale fishing industry, were extensively damaged. Furthermore, according to the Ministry of Fisheries and Aquatic Statistics (2005), 34% of all affected houses belonged to people who worked in fisheries or fishery-related industries. The tsunami destroyed not only their houses but also their fishing vessels and nets. As a result, 70,000 fishermen lost their livelihoods. In addition, the Ministry of Urban Development and Water Supply (2006) reported that 31,403 squatter families, comprising approximately 20% of the 150,000 people in the Colombo Metropolitan Region (CMR), including Colombo and Kaluthara, were affected by the tsunami². Thus, housing issues caused by the tsunami disaster were felt most strongly in urban and fishing areas.

2.2 Housing reconstruction program

(1) Institutional arrangements (Tittawella, M., 2005)

The Sri Lankan Government established the Task Force for Rebuilding the Nation (TAFREN) as the primary institutional mechanism for recovery and reconstruction, and TAFREN (2005a.) declared four objectives: 1) Returning People to Their Homes, 2) Restoring Livelihoods, 3) Health Education and Protection for All, 4) Upgrading National Infrastructure. The Tsunami Housing Reconstruction Unit (THRU) was also established to manage and focus on housing reconstruction.

(2) Outline of housing reconstruction

TAFREN and THRU provided the framework for the following three categories of recovery housing: 1) Emergency shelters (**Photo 1**), 2) Temporary houses (**Photo 2**), and 3) Permanent houses (**Photo 3**). For the third phase, the Buffer Zone settlement is an important concept. In Sri Lanka, uncontrolled development had been taking place in coastal areas due to the growth of the tourist industry from the 1950s to the 1970s. However, in 1981 the Coastal Conservation Department designated "Buffer Zones" as part of the Coastal Conservation Zone (CCZ) to regulate development in coastal areas (R.A.D.B. Samaranayake). According to the Urban Development Authority (2005.a), the CCZ is divided into two parts, the 1st and 2nd strips (see **Table 2**), depending on the distance from the mean high water line. The 1st strip (100 m landwards on the west coast and 200 m landwards on the east coast) was defined as a "Buffer Zone," and reconstruction of affected houses in this area was regulated. Donor-built reconstruction programs were implemented for all affected families in the Buffer



Photo 1 Emergency shelter



Photo 2 Temporary house



Photo 3 Permanent house

Table 2 Definition of the Coastal Conservation Zone

Source: Urban Development Authority (2005), Physical Planning Guidelines and Project Proposals for the “Vulnerable” Coastal Zone of Sri Lanka

Land strip	Zone 1 (West coast from Point Pedro to Point Dondra)	Zone 2 (East coast from Point Pedro to Point Dondra)	Activities allowed	Type of housing reconstruction program
1st strip Buffer Zone	100m landward	200m landward	1. Buildings for the coastal conservation 2. Activities in connection to the fisheries industry (Harbors, piers, anchorages, warehouses) 3. Historic monuments and archeological sites	Donor-built reconstruction program
2nd strip	101m - 1000m	201m - 1000m	Activities allowed by Coastal Conservation Department	Home Owner driven housing Reconstruction program

Zone, and the Homeowner-Driven Housing Reconstruction Program was applied to damaged houses outside the Buffer Zone. This paper focuses on the Donor-built Reconstruction Program, and compares the regional differences in this program.

3. DONOR-BUILT RECONSTRUCTION PROGRAM (TAFREN, 2005A AND 2005C)

This section describes the guidelines of the Donor-built Reconstruction Program. The aim of this program was to provide houses constructed inland to people affected in the Buffer Zone, funded by private donors. The main policies were as follows:

- All affected families are entitled to a house built inland by a donor agency in accordance with Government standards.
- Affected families do not need to prove land ownership.
- The beneficiary remains the legal owner of his/her property within the Buffer Zone and receives full title to the property on the resettlement site.
- To sustain a sense of community, the Government will settle people as close as possible to their original homes.

Fig. 2 shows the process of the Donor-Built Reconstruction Program. First, the donor applies to TAFREN with a plan for the amount of the grant, the number of houses, and the location of construction. Next, TAFREN vetted the donor plan and found projects that fit their criteria. Then, after arriving at an agreement, TAFREN and the donor concluded a contract and coordinated the type of housing and the community plan. In this program, it was notable that the donor’s opinion was reflected in the plan.

4. STATUS OF PERMANENT HOUSE CONSTRUCTION (TAFREN, 2005D)

4.1 Data

In March 2006, TAFREN published a report, “Construction Status - Donor-built Housing Projects,” listing the sites, donors, landowners, number of houses constructed, house types, dates of commencement, and the construction status (Foundation, Walls, Roof, Finishes, Completed, Handed Over to Beneficiaries) of its projects.

4.2 Project summary

- (1) Houses assigned to donors

Fig. 3 shows the number of houses needed for the Donor-built

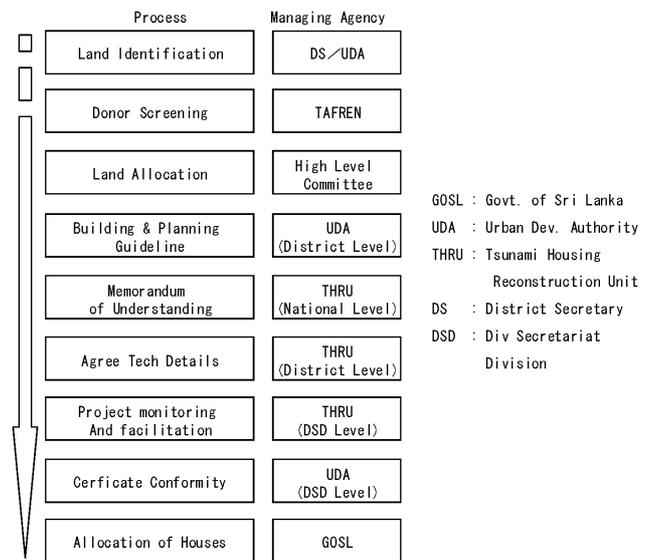


Fig. 2 Process flow of housing reconstruction
Source: TAFREN (2005), Housing & Township Development

Reconstruction Program and the number of houses assigned to donors as of March 10th, 2006. In all districts, except Hambantota, Matara and Killinochchi, the number of houses assigned to donors was less than the number of houses needed. In some cases, the number assigned to donors was less than 40% of the number needed. The situation was the reverse in Hambantota, Matara and Killinochchi; the reason for these differences is explored in detail in Section 5.1.

(2) Site landowners

Each area allocated for housing construction belonged to either a government organization (Education Department, Land Reform Commission, Urban Development Authority, National Housing Development, Sri Lankan Railway), or private individuals or organizations (Buddhist temples, etc.). **Fig. 3** shows the ratio of houses constructed by each landowner-type. As shown in **Fig. 3**, the overall ratio was 61% public and 26% private, but in Colombo, Gampaha and Hambantota, the ratio of private land was higher than that of government land. For example, in Kaluthara, with insufficient land for permanent housing due to the high population density, private land comprises 50% of housing construction. This trend is also seen in Colombo and Gampaha, both in the Colombo Metropolitan Region. In Hambantota, 10 of 53 sites were located on properties belonging to the Urban Development Authority

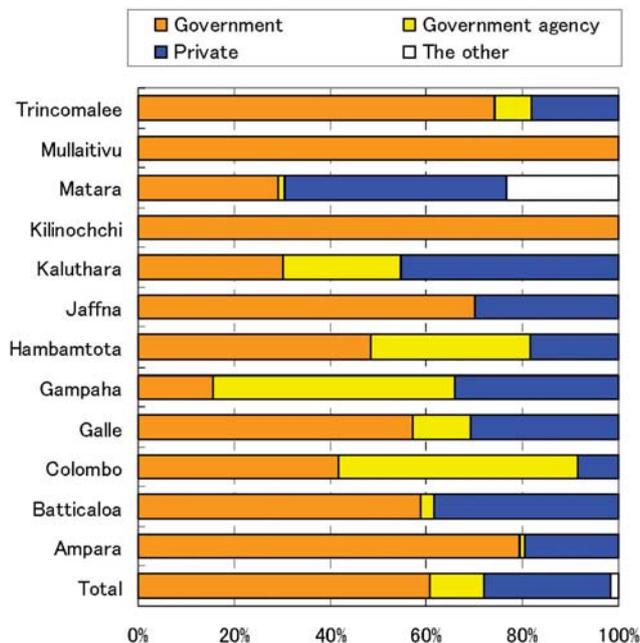
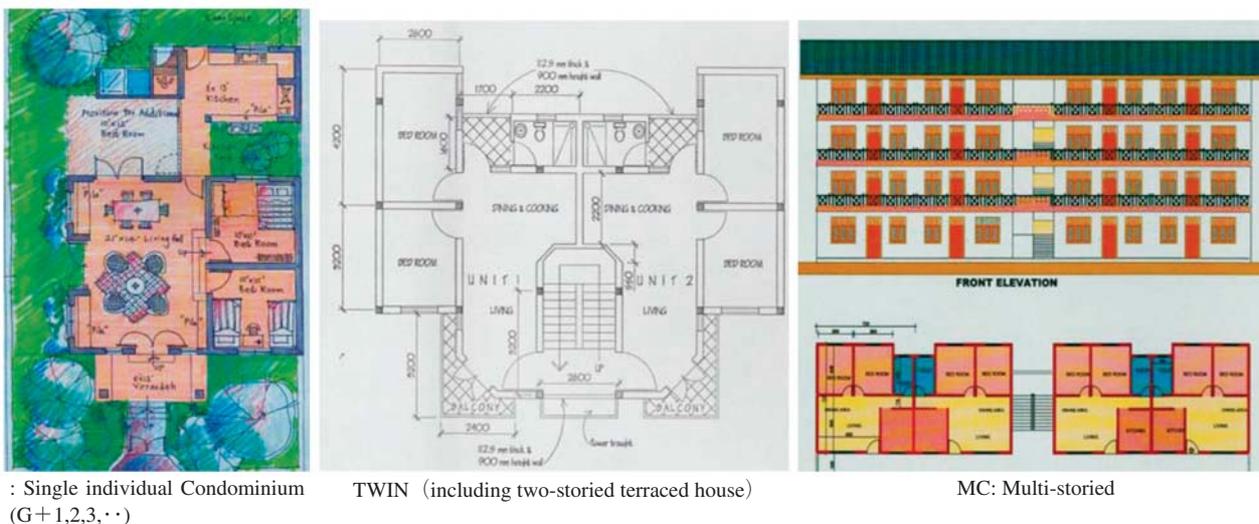


Fig. 3 Ratio of houses constructed by landowner-type ¹³⁾



: Single individual Condominium (G+1,2,3,∞)

TWIN (including two-storied terraced house)

MC: Multi-storied

Fig. 4 House type

Source: Urban Development Authority (2005b), Rehabilitation and Reconstruction of Tsunami Affected Areas

(UDA), which managed all project sites, public or private. Additionally, in the Matara District, there were five sites previously owned by a Buddhist temple.

(3) House types (Urban Development Authority, 2005b)

Guidelines for permanent house construction included the following: 1) The number of houses on each site should be less than 250; 2) The total floor area should be at least 45m² (value approximately 400,000 Rs.⁴) for each house; 3) The population density of the site should be less than 150 units/ha³; 4) Areas of multi-storied housing should comprise less than 65% of the site. Information on the type of house to be built in the selected settlement was provided to the donor by the UDA. Types included the following: a) Single-storied individual (SI), b) Single-storied terrace (ST), c) Twin (Twin), d) Two-storied terrace (TT), e) Multi-storied

Condominium (MC) (Fig. 4).

Fig. 5 shows the ratio of houses by housing type. While the SI type comprised over 80% of the total, G+3 type accounted for a high ratio in Colombo and Gampaha. This was due to the high population density in these areas, 3,305/km² and 1,541/km², respectively; the national average is 299/km², (Department of Census and Statistics, 2001). Conversely, all types except SIs accounted for 50% of the houses in Kaluthara, next to Galle, and a high ratio of SIs is evident in the eastern and northern districts, including Batticaloa, Trincomalee, Killinochchi, and Jaffna.

(4) Donors

In this program, donors include NGOs, private companies, and the governments of various countries. As shown in the process flow in Fig. 2, donors play an important role in the program. Fig.

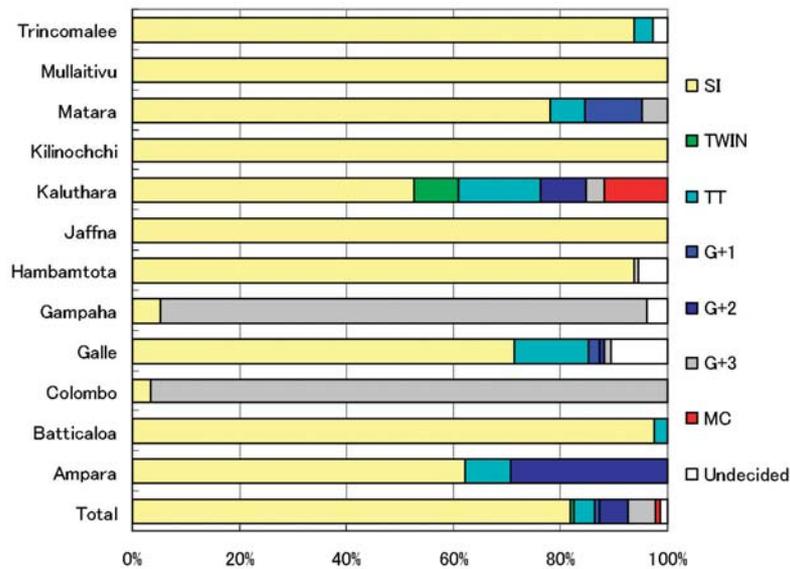


Fig. 5 Number of houses by housing type

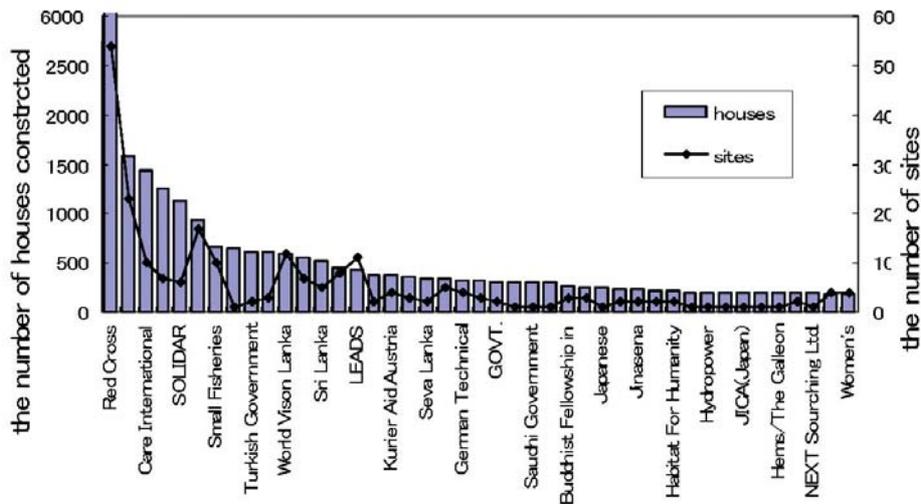


Fig. 6 Number of houses constructed and sites by donor

6 shows the number of sites and houses constructed by donors, listing the 43 highest-ranking donors by the number of houses constructed. These 43 donors funded 70% of the 33,821 houses assigned to donors. The five largest donors were the Red Cross, the Lions Club, Care International, the Tamil Rehabilitation Organization and SOLIDAR, in descending order. All of them funded the construction of more than one thousand houses; the Red Cross alone supported the construction of 5,054 homes, approximately 15% of the total.

5. REGIONAL COMPARISONS OF THE PROJECT

5.1 Changes in construction program

This section examines the changes of construction status of permanent houses in each district. The number of houses contracted between TAFREN and donors was 33,821, approximately 70%

of the 49,233 houses required in this project.

(1) Houses required and under construction

Fig. 7 shows the number of houses required and the transition of houses under construction in each district. The left column of the figure lists districts located from east to north: Ampara, Batticaloa, Trincomalee, and Jaffna. The right side lists districts from west to south: Colombo, Kaluthara, Hambantota, and Matara. First, in Ampara, 21,201 houses were damaged by the tsunami, the highest number in Sri Lanka. For this reason, the number of houses needed in Ampara amounted to 12,481. As indicated in the figure, the construction of permanent houses started in May 2005 and increased until December 2005. However, only 40% of the required houses were constructed. In Batticaloa, the second most affected district, the number of required houses was 4,426, and construction started in July, two months after Ampara. Construction increased until January 2006; however, only 60% of the required number has been constructed.

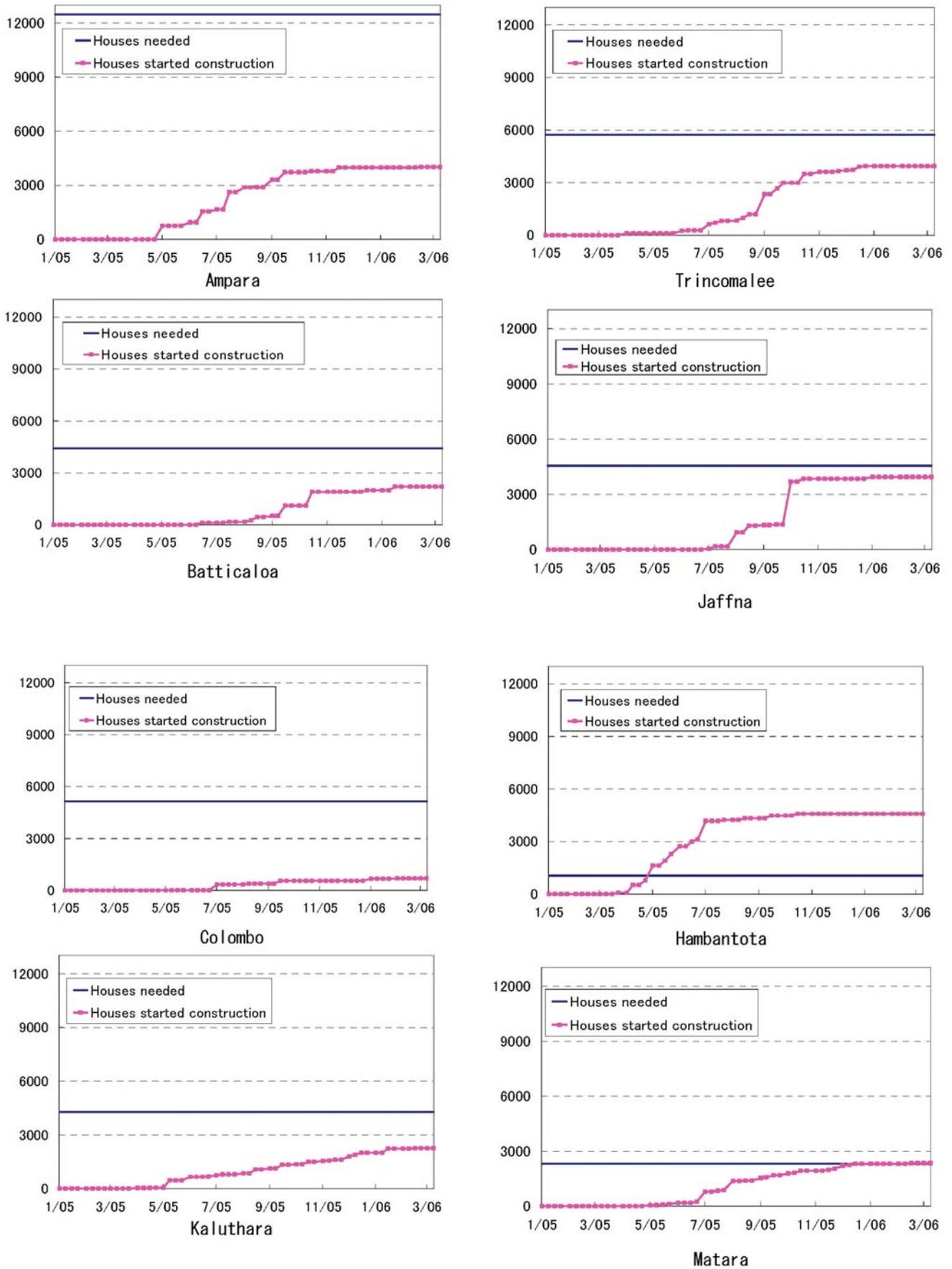


Fig. 7 Transition of the number of houses started construction

This trend was also evident in the Trincomalee District; however, in Jaffna, the situation was slightly different. Construction in Jaffna started in July 2005 and increased until October 2005, after which approximately 90% of the houses were completed.

Next, the situation in areas located from west to south are examined. In Colombo, construction started in July 2005, but increased very slowly afterwards. This trend was also seen in Kaluthara. Both areas are located in the CMR, and, as shown in the above figure, these areas have a high population density. Thus, it appears that the land for new housing was not sufficient, and construction has not proceeded at an adequate pace.

In the Matara District, however, the number of houses under construction was equivalent to the number required. Furthermore, in Hambantota District, the number of houses constructed was in fact greater than the number required as of May 2005, and 1,368 of 4,574 houses assigned to donors have been planned on land belonging to the UDA. As the UDA was in charge of managing land for these projects, it appears that this was the reason construction in Hambantota had accelerated. Another reason for this surplus was the large Muslim population in Hambantota. In Muslim areas, there are multiple families per house, thus, there were more families than originally thought. Under the current guidelines, the government allocates one house to each family. Thus, in Hambantota, the number of houses constructed was greater than the number originally planned.

(2) Change in the ratio of houses under construction

Fig. 8 shows the change in the ratio of houses under construction against the number of houses contracted between TAFREN and donors from January 2005 to March 2006. As indicated in the figure, construction in Hambantota started earlier than in other districts, and construction continued after March 2005 in Mullaitivu⁵. The remaining districts show almost identical trends, except for the date the project was initiated.

It appears that there were several regions where the need for permanent housing was less urgent, but the construction process was practically identical once contractual agreements were concluded between TAFREN and the donors. Thus, whether a donor is available is the key factor in initiating the project.

5.2 Study of regional differences

This section examines the factors that affect the differences in the progress of housing construction projects based on on-site interviews with government officials and residents of the affected areas.

1) Regional differences in donor interest

Based on an interview with Central Engineering Consultancy Bureau, even though TAFREN finally decides where the donors join the housing reconstruction projects, they can suggest to TAFREN which areas they build housings in. According to this, while much attention was directed at humanitarian aid from donors in urban areas such as Colombo and Kaluthara there were not enough donors in the poorer eastern districts, such as Ampara and Batticaloa. As shown in **Table 3**, the number of houses constructed was only 40% of the number needed. The fact that the project reflected donor interest is considered a reason for the unbalanced distribution of donors between affected areas. It is thus important to examine how donors take part in disaster recovery projects.

2) Shortage of land in urban areas

While there were numerous donors willing to contribute to housing reconstruction in Colombo and Kaluthara, there was insufficient land for these projects⁶. As a result, the ratio of multi-storied condominiums in these areas was high compared to eastern and northern areas (**Fig. 5**). In the Donor-Built Reconstruction Program, land was distributed to the donor after the UDA secured the land for construction. In urban areas, TAFREN and the donors did not conclude a contract for housing construction due to a shortage of available land.

3) Political issues and communication

There are other reasons for the regional differences in housing construction projects. In Sri Lanka, the Sinhalese people form the largest ethnic group, and are a majority of the total population. Tamils are concentrated in the northern, eastern, central and western provinces of the country. A proportion of Tamil people from smaller ethnic groups are active in the anti-government organization, Liberation Tigers of Tamil Eelam (LTTE). Some LTTE factions obstructed local reconstruction projects. In the eastern districts, including Ampara and Trincomalee, they led a strike known

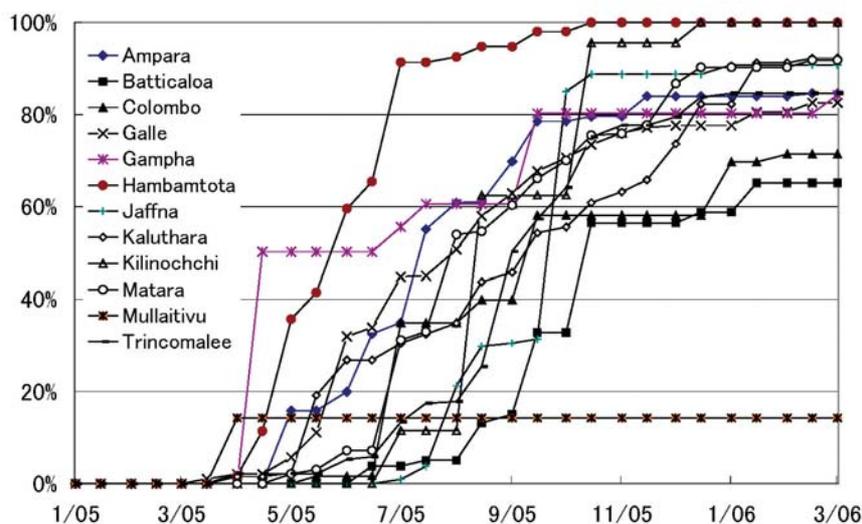


Fig. 8 Transition of the ratio of houses started construction against the number of houses contracted

Table 3 Number of houses needed and houses assigned to donors (as of Mar. 10th 2006)

	?Total required houses	?No. of houses assigned to donor	?/?	Balance
Ampara	12,481	4,741	38%	-7,740
Batticaloa	4,426	3,376	76%	-1,050
Colombo	5,150	965	19%	-4,185
Galle	5,196	3,832	74%	-1,364
Gampaha	650	406	62%	-244
Hambantota	1,057	4,574	433%	3,517
Jaffna	4,551	4,337	95%	-214
Kaluthara	4,275	2,447	57%	-1,828
Kilinochchi	288	1,237	430%	949
Matara	2,316	2,553	110%	237
Mullaitivu	3,011	700	23%	-2,311
Trincomalee	5,737	4,653	81%	-1,084
Total	49,138	33,821	69%	-15,317

as a *hartaal*. Construction projects in Trincomalee were interrupted for two months from December 2005 to January 2006⁷. It is important to avoid minimizing these political issues.

Additionally, there were problems in communicating information on housing construction projects, and many people were not informed of the conditions or availability of official support (Steering Committee, 2005). Such miscommunications caused delays in almost all housing reconstruction project, and these are common problems that must be addressed in any recovery project.

6. CONCLUSION

This paper focuses on post-tsunami housing reconstruction in Sri Lanka, particularly the Donor-built Housing Project, and examines the process, problems and future directions of these projects. The conclusions are as follows:

- ① While the number of houses completed six months after the tsunami was over 90% of the total required, this number was only 60 - 70% in Colombo and Ampara at one year post-tsunami. Regional differences like these were evident in housing construction projects throughout Sri Lanka.
- ② Lack of land in urban areas and lack of donors in rural areas caused delays in housing reconstruction programs.
- ③ Housing construction was delayed in some areas due to strikes related to racial conflict.

In all housing construction projects, the distribution of aid and the role of donors were of paramount importance. The processes and problems elucidated by this paper will be valuable for future recovery projects.

Finally, the number of objections to regulations in the Buffer Zone from people in fisheries has prompted the Sri Lankan Government to review its policies. A re-examination of the guidelines and issues in housing construction projects, which are continuing until 2007, is required.

ACKNOWLEDGEMENTS

This paper was supported by the "Restoration Program from Giant Earthquakes and Tsunamis, Granted by the Special Coordination Funds for Promoting Science and Technology, Ministry of Education, Culture, Sports, Science and Technology. We are grateful for the assistance of Nihal Rpsinghe, (Central

Engineering Consultancy Bureau), Dr. Srikantha Herath, (United Nations University), and Navindra De Silva, (Senior Japanese Interpreter of JICA).

NOTES

¹ Sri Lanka is divided into, Province, District, Divisional Secretariat Division, and Grama Niadhari Division.

² Houses of squatters built illegally, the affected number is not included in the official publication (Fig. 1).

³ According to a report by the Urban Development Authority¹⁴, the minimum area is 500sq.ft., and the density is 60 unit per Acre.

⁴ 1Rs. is approximately 1.14 yen (as of April 2006). And according to the Department of Census and Statistics, the average salary in Sri Lanka is 13,000Rs. (approximately 14,000 yen), 22,000Rs. in urban areas, 7,000Rs. in rural areas.

⁵ Mullaitive was dropped from the project target for some reason from December 2005 to March 2006. Therefore, construction ceased after November 2005.

⁶ Based on an interview with an anonymous official at the Central Engineering Consultancy Bureau in December 2005.

⁷ Based on an interview with various government employees, construction site workers, and residents in the affected area (Trincomalee) in March 2006.

REFERENCES

- Department of Census and Statistics, 2001. Population and population density by district, 1981 and 2001, <http://www.statistics.gov.lk/census2001/index.html>
- Department of Census and Statistics, 2005. Census of Persons, Housing Units and Other Buildings affected by the Tsunami, 26th December 2004
- Maki, N., Miura, K., Kobayashi, M., and Hayashi, H., 2003. Relocation process at resettlement site after the 1992 Flores Earthquake and Tsunami Disaster, 1-8, Journal of architecture and planning, Architectural Institute of Japan (in Japanese)
- Maeda, M., Nakagawa, Y., Yamada, K., and Funo, S., 2007. Consideration of the realities and issues of settlements in the south west coast of Sri Lanka after the Sumatra Earthquake and the Indian Ocean Tsunami in 2004 - From the perspective of resuming normal life - , 183-190,

- Journal of Architecture and Planning, Architectural Institute of Japan (in Japanese)
- Ministry of Fisheries and Aquatic Statistics, 2005. Fishermen's Houses Affected by Tsunami, <http://www.fisheriesdept.gov.lk/tsunami/houses.html>
- Ministry of Urban Development and Water Supply, 2006. First REEL Rehousing Project, <http://www.urbanlanka.lk/Tsunami/reel.html>
- R.A.D.B. Samaranayake, Sri Lanka's Agenda for Coastal Zone Management, <http://www.coastal.gov.lk/showresearch.php?ankaya=11>
- Serving Sri Lanka, 2005. Humanitation Situation Report -27 May - June 2005, http://servesrilanka.blogspot.com/2005_05_29_servesrilanka_archive.html
- Steering Committee (Ministry of Finance and Planning), 2005. Joint Report of the Government of Sri Lanka and Development Partners
- TAFREN, 2005a. Rebuilding Sri Lanka Post-tsunami Reconstruction & Rehabilitation, TAFREN Progress & News, June 2005
- TAFREN, 2005b. Housing & Township Development
- TAFREN, 2005c. Donor Assisted Housing & Township Reconstruction
- TAFREN, 2005d. Construction Status -Donor Built Housing Projects
- Tittawella, M. 2005. Rebuilding Sri Lanka Post Tsunami, ADB Manila Summit on January 11th, 2005
- Urban Development Authority, 2005a. Physical Planning Guidelines and Project Proposals for the "Vulnerable" Coastal Zone of Sri Lanka
- Urban Development Authority, 2005b. Rehabilitation and Reconstruction of Tsunami Affected Areas