

32nd WEDC International Conference, Colombo, Sri Lanka, 2006

SUSTAINABLE DEVELOPMENT OF WATER RESOURCES, WATER SUPPLY AND ENVIRONMENTAL SANITATION

**Tsunami disaster 2004 : Lessons from resettlement**

*Dharmasiri De Alwis, Sri Lanka*

*The tsunami disaster of 26 December 2004 killed over 30,000 people, displaced 1,000,000 persons and affected over two thirds of the island's coastline lying in 12 districts. Besides the loss of life and injuries, the tsunami caused extensive damage to infrastructure and property and disruptions of fisheries and other livelihood activities and business assets. After the emergency repairs were attended the government has entered into the phase of rehabilitation and reconstruction of national infrastructure in the affected areas with the assistance of many development partners. However, the national construction industry has not been able to cater to the demand or need of tsunami reconstruction work. Further challenges include procurement delays, ensuring environmental safeguards, security concerns in the uncleared areas and capacity constraints. As far as the new settlements for the beneficiaries are concerned, development of infrastructure such as water, electricity and internal roads remain the biggest challenge to the government.*

**Impact of tsunami disaster**

The tsunami waves, which devastated over two thirds of the coastal belt of twelve districts in the North, East, South and the West of the island affected about one million people and claimed 35, 322 human lives, injured 21441 and left 1500 children without parents. Social networks were disrupted, assets were destroyed and infrastructure facilities such as water and electricity were severely affected.

There was massive assistance from the local and international civil society, who provided shelter, mobilized to clear roads.

The government and the Liberation Tigers of Tamil Eelam (LTTE) had mutually agreed, how to proceed with rescue and relief operations in the North and East.

**Damage and international response**

The total cost of relief, reconstruction and rehabilitation had been estimated at US\$ 2.2 billion. The government had projected that it would take 3-5 years to rebuild destroyed structures and restore full recovery. The largest financing needs were identified as shown below:

East – 45%, South – 25.9%, North – 19% West-10.1%

**Institutional mechanisms**

Subsequent to the Tsunami disaster, positive collective actions were taken on a scale never before. Recognising the seriousness of the loss, coupled with lack of experience, the government created an institutional mechanism to co-ordinate assistance. The President immediately set up three task forces:

- (i) Task force for Rescue and Relief (TAFRER)

- (ii) Task Force for Law and Order and Logistics (TA-FLOL)

- (iii) Task Force to Rebuild the Nation (TAFREN)

At the national level, the Centre for National Operations (CNO) was established under the chairmanship of the President to co-ordinate relief operations and to collect and disseminate information.

In the delivery of humanitarian assistance to the uncleared areas the government and the LTTE cooperated with each other well. Meanwhile, the government appointed a Parliament Select Committee on natural disaster, which made significant progress to pass a Disaster Management Act.

To manage the rebuilding exercise, in September 2005 TAFREN itself recognized that it should focus on four areas namely:

- (i) Getting victims back into homes
- (ii) Restoring livelihoods
- (iii) Health, Education and Protection for all
- (iv) Upgrade National Infrastructure.

**Organization and co-ordination**

In the latter part of 2005 the Cabinet of Ministers approved the establishment of an authority combining all organizations under various ministries that carry out relief, rehabilitation and reconstruction caused by man-made or natural disasters.

By May 2005, the signing of the “Post-Tsunami Operational Management Structure” (P-TOMS) agreement took place. However, the constitutionality of the agreement was challenged in the Supreme Court, and it kept certain provisions on hold pending clarification.

The state agencies promptly attended to the infrastructure

retains within the first two weeks. Damaged bridges and roads were repaired with the assistance of various partners and telephone lines and electricity supply were restored within a short period. Similarly the railway transport system was put in operation within the first month.

### **Transitional shelter – Policy and achievements**

The displaced families initially found shelter in emergency accommodations such as tents, public buildings and religious places or sought refuge with friends and relatives. Therefore transitional shelters were required to bridge the gap between emergency accommodation and permanent housing.

A transitional shelter must not only provide protection from the environment but should provide secure habitable living space and a platform for re-establishing livelihoods.

Due to the efforts of the government and its development partners, 54, 102 shelters were completed by November 2005. Treated water was supplied to camps and temporary settlements using 80 water bowsers and pipelines. Over 5000 toilets have been constructed along with bathing facilities.

### **Buffer zone or setback zone**

Consequent to the disaster, the government made a quick decision to introduce a buffer zone 100 metres wide in the south and southwest. And 200 metre wide in the north and east, as the damage to life and property was greater there than in the south.

The introduction of buffer zone has however created two types of housing programmes, as a policy. One programme is to build new houses by the donors, while the other is by the owners themselves.

#### **(i) Donor-built housing reconstruction programme**

All affected families are entitled to a house built by a donor in accordance with government policy. The donor has to provide each new settlement with internal common infrastructure while the government is obliged to provide the services such as, drinking water supply, electricity and access roads up to the relocation site.

Table 01 shows the total number of housing units to be built under the Donor-built programme. The number of houses required has been obtained from three sources and it is very clear that they do not tally with each other. Due to this difficulty, information in the first column has been taken as authentic.

#### **(ii) Home-owner driven housing reconstruction programme**

This programme involves reconstruction of partly or fully damaged houses which were situated outside the buffer zone. The government provides a cash grant reimbursed by different development banks and bilateral donors, to an affected homeowner for the reconstruction of his/her house.

This programme is funded by a consortium of four donors. Under this programme, a house is either classified as a partially damaged (32, 497) or a fully damaged (23028). Table 02 shows an estimated additional 11,000 houses under

the same programme.

The Tsunami Housing Reconstruction Unit (THRU) was thus created on 30 March 2005 with the approval of the Cabinet of Ministers and it was placed under the Ministry of Urban Development and Water Supply. Similarly, an Institutional Arrangement for the Home Owner-Driven programme was realized and the following organizations were thus created.

- (a) SouthWest Housing Reconstruction Unit (SWHRU) to function under the TAFREN
- (b) North East Housing Reconstruction Unit (NEHRU) to operate under the Ministry of Relief, Rehabilitation and Reconciliation.

### **Restoring livelihoods**

It has been estimated that about 150,000 people lost their main source of income. Nearly 50% of them were in the fisheries sector and the rest were in agriculture, tourism, public sector, small and micro enterprises and other sectors.

TAFREN is tasked with the overall co-ordination of all livelihood programmes in collaboration with the line ministries. About eight ministries and 100 international and national organizations are involved in livelihood restoration activities.

### **Upgrading national infrastructure**

The government recognized that thorough and permanent infrastructure rebuilding measures form a vital part of the Tsunami recovery process. Therefore, immediate tasks have been put in hand quickly to restore services

#### **(i) Roads**

Over 1000 km of national roads, together with 1500 km of provincial roads and unclassified roads of local authorities are targeted for reconstruction and rehabilitation. The cost is estimated at US \$ 317 million for national roads and US\$39 million for provincial and other roads.

#### **(ii) Railways**

The total cost of damage to rolling stock is estimated at Rs. 175 million, Rs. 360 million for tracks and bridges, Rs. 900 million for signal and communication network and Rs. 50 million for staff quarters.

#### **(iii) Electricity**

Ceylon Electricity Board (CEB) has assigned itself the goal of restoring electricity supply to all Tsunami affected areas. This is being done under the “Sri Lanka Tsunami Affected Areas Recovery and Take-off (STAART). Project to provide electricity to 23000 homes in year 2005.

#### **(iv) Water supply and sanitation**

In this sector, the overall goal is provision of sufficient and sustainable water supply and sanitation services to the Tsunami affected areas. The targets have been spread over three phases namely, emergency, restoration and expansion.

The overall cost of rebuilding water supply and sanitation facilities has been US\$201 million. Of this approximately US\$36 million is for direct Tsunami damage. Current donor

**Table 1. Construction Status Up to 31 March 2006 – Donor Built Housing Programme**

Districts	Source: District Administration	Source: Department of Census & Statistics	Source: Reconstruction and Development Agency (RADA)	No. of Units Assigned to Donors	No. of MOUs Signed	Land Details		Total Under Construction	Total Completed	Hand over to Beneficiaries
						No. of Lands	No. of Housing Sites			
Jaffna	4551	4551	3275	4337	4337	43	50	765	283	207
Kilinochchi	288	288	288	1237	1237	15	16	0	143	-
Mullaitivu	3011	3011	0	700	700	1	3	0	-	-
Trincomalee	5737	5737	3428	4506	4506	43	58	902	345	116
Batticaloa	4426	1469	1458	3378	3378	25	30	387	348	94
Ampara	12481	8435	7236	5250	5250	33	41	1395	629	381
Hambantota	1057	932	3107	4998	4998	38	53	1521	2234	1737
Matara	2316	2759	1032	2899	2899	45	57	1448	183	142
Galle	5196	4884	2213	3874	3874	66	90	1362	1311	950
	4275	2975	2179	2458	2458	41	53	1132	384	221
Colombo	5150	5998	5112	965	965	10	12	376	41	8
Gampaha	650	643	643	406	406	5	6	152	58	58
Puttalam	95	56	23	-	-	-	-	0	-	-
<b>Grand Total</b>	<b>49233</b>	<b>41738</b>	<b>29994</b>	<b>35008</b>	<b>35008</b>	<b>365</b>	<b>469</b>	<b>9440</b>	<b>5959</b>	<b>3914</b>

Source : Reconstruction And Development Agency, December 2005 (RADA)

**Table 2. Estimates of Damaged Housing Units and Status of Rebuilding under Respective Programmes**

District/Province	Donor Driven Housing Reconstruction Programme (Inside the Buffer Zone)				Home-Owner Driven Programme (Outside the Buffer Zone)		
	No. of Damaged Houses (From Div.Sec)	Housing Requirement Phase I	No. of MOUs Signed	No. of Units Under Construction	In Progress	Disbursed Amount (SLR)	Housing Requirement Phase II (I)
Jaffna	5,109	3,275	2,878	733	558	42,990,000	1,276
Mullaitivu	5,556	3,011	700	-	2,545	129,710,000	-
Kilinochchi	288	288	43	145	-	-	-
<b>Northern Prov.</b>	<b>10,953</b>	<b>6,574</b>	<b>3,621</b>	<b>878</b>	<b>3,103</b>	<b>172,700,000</b>	<b>1,276</b>
Batticaloa	17,948	1,458	3,540	453	16,479	1,020,300,000	11
Trincomalee	8,074	3,428	4,794	771	2,837	280,970,000	1,809
Ampara	24,438	7,236	3,874	1,018	16,103	887,520,000	1,099
<b>Eastern prov.</b>	<b>50,460</b>	<b>12,122</b>	<b>12,208</b>	<b>2,242</b>	<b>35,419</b>	<b>2,188,790,000</b>	<b>2,919</b>
Hambantota	4,084	2,343	3,618	3,155	1,192	87,505,000	549
Matara	7,464	1,032	2,951	1,130	4,705	458,520,000	1,727
Galle	12,781	2,213	3,729	1,872	7,897	445,030,000	2,671
<b>Southern Prov.</b>	<b>24,329</b>	<b>5,588</b>	<b>10,298</b>	<b>6,157</b>	<b>13,794</b>	<b>991,055,000</b>	<b>4,947</b>
Kalutara	6,124	2,179	2,357	916	3,149	250,470,000	796
Colombo	5,984	5,112	888	280	28	3,775,000	844
Gampaha	675	643	268	234	32	2,860,000	-
<b>Western Prov.</b>	<b>12,783</b>	<b>7,934</b>	<b>3,513</b>	<b>1,430</b>	<b>3,209</b>	<b>257,105,000</b>	<b>1,640</b>
	<b>98,525</b>	<b>32,218</b>	<b>29,640</b>	<b>10,707</b>	<b>55,525</b>	<b>3,609,650,000</b>	<b>10,782</b>

Source : Reconstruction And Development Agency, December 2005

commitments amount to Rs. 16.5 billions, leaving Rs. 6.8 billion unfunded.

Ground wells have been cleaned, but the quality of water was such they were unfit for human consumption, being pol-

luted. Therefore, the state has been forced to implement new large water supply projects to cater to the existing and new settlements. The capacity of the state implementing agencies has therefore been stretched with the new projects underway

causing a significant capacity building programme.

Furthermore, effective coordination mechanism to facilitate the partners in housing, water supply electricity and roads at all levels of the government has still not been created. This is crucial to ensure that the new settlements are provided with basic infrastructure facilities.

In the water sector, several particular problems were identified including sustainable maintenance of water and gully bowsers and packaged water treatment plants, commencement of sanitation studies and development of sewerage for new settlements.

The government had already passed environmental legislation and entrusted the institutions with the responsibility of ensuring that environmental concerns are incorporated into development projects. However implementing this legislation is complicated by the significant population utilizing coastal resources on a daily basis.

## Findings and conclusions

With the reconstruction programme now entering its second year, it is possible to learn from the past years experience and develop an agenda of actions that must be taken quickly by all partners to move the process forward.

- (i) It is the view of both internal and external observers that Sri Lanka has made considerable progress in the reconstruction of buildings and infrastructure. The event yielded immense international goodwill, external assistance and even revival of the peace process.
- (ii) The primary guiding principle of the programme is that of equity. Funding pledges were however adequate. Therefore, it is vital that all pledges are converted into commitments and all commitments into disbursements.
- (iii) During the implementation of the programme, it was realized that a very powerful organization should have been created, to direct the operations at all levels instead of "Task Forces".
- (iv) The programme of reconstruction is mainly housing, infrastructure, landscape, storm-water drainage system etc. and therefore the District Organisation should have been headed by an experienced Technical Person such as a Civil Engineer.
- (v) There have been several instances where lands unsuitable for human settlement and building purposes were identified. Reclamation of such lands has been costly and time consuming.
- (vi) The Memorandum of Understanding (MOU) signed between the government and the Donor is a weak document.
- (vii) Every affected family should know, their future, in terms of housing, employment, relief support, education for their children and with health care.
- (viii) A serious shortcoming in the monitoring process has been the furnishing of unreliable data and information to the Data Bank and Management Information System.

- (ix) According to the MOU signed the basic infrastructure such as water, electricity and internal roads has to be provided by the donor, if the housing component in the settlement has been undertaken by a single donor.
- (x) Different donors have adopted layouts of their choice in constructing the houses. However, these different layouts have resulted different positions for toilets and kitchens.
- (xi) A very serious lapse on the part of the planning has been the search for water sources, after constructing the houses. Disposal of garbage too has caused inconvenience to the beneficiaries, as it has not been considered during planning.
- (xii) A gender issue that is faced by the tsunami affected areas has been the benefits such as cash grants which have gone to the chief occupant of the household, generally a male.
- (xiii) Regarding transitional shelters, they need be maintained and upgraded until permanent housing is complete.
- (xiv) Constraints on construction capacity and cost of infrastructure supplies are rising much faster than anticipated.
- (xv) The damage caused to the environment includes salinization of paddy fields, agricultural lands and ground wells.

## References

- Housing & Township Development – Presidential Secretariat, March 2005
- Housing & Township Development – Presidential Secretariat, June 2005.
- Donor Assisted Housing & Township Reconstruction – Presidential Secretariat, March 2005
- Tsunami Housing Reconstruction Unit (THRU)–Presidential Secretariat, March 2005.
- Post Tsunami Recovery : Issues and Challenges in Sri Lanka – Institute of Policy studies of Sri Lanka, November 2005
- Post Tsunami Recovery and Reconstruction – Joint Report of the Government of Sri Lanka and Development Partners, December 2005.

## Contact addresses

Eng. Dharmasiri Susith De Alwis  
 Technical Advisor  
 Reconstruction And Development Agency (RADA)  
 No. 41, Janadhipathi Mawatha,  
 Colombo 01.  
 Sri Lanka  
 Tel: 94-011-2 496800 – upto 5, Ext : 722  
 Mobile:077-3315948