Post Tsunami Recovery Process in Sri Lanka

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ABSTRACT

The Indian ocean tsunami on 26 December 2004 was the biggest natural disaster in the history of Sri Lanka. Unlike many other countries affected by this tsunami, the damage in Sri Lanka was so widespread that about two thirds of the coastline from the northern Jaffna peninsula, along the eastern coast down to the southern tip of Dondra Head, as well as the relatively sheltered southwestern and western coasts, were subjected to inundation. More than 35,000 people died, 100,000 houses were damaged and 500,000 people were displaced, while the severe damage caused to infrastructure and environment exceeded US $ 900 million. It has been estimated that 3 to 5 years will be needed to complete the rehabilitation and reconstruction task at a cost of nearly US $ 2.2 billion. The recovery program has made some significant progress in certain areas and actions have also been initiated to improve the disaster mitigation capability in the country. This paper reviews the issues, problems associated with and progress of the recovery process as well as the work carried out to mitigate potential future disasters in Sri Lanka.

1. INTRODUCTION

On 26 December 2004, the coastal areas of Sri Lanka were devastated by a tsunami, a natural disaster previously unknown to almost all Sri Lankans. Except for monsoonal flooding, landslides or occasional cyclones, Sri Lanka had previously been free from major natural disasters and the tsunami was by far the largest disaster experienced by the country.

Unlike in many other countries affected by this tsunami, the damage in Sri Lanka was so widespread that about two thirds of the 1400 km long coastline was affected. The directly exposed coastline from the northern Jaffna peninsula, along the eastern coast down to the southern tip of Dondra Head, as well as the relatively sheltered southwestern and western coasts, were inundated by the tsunami. The affected areas in terms of the smallest administrative divisions, i.e. GN divisions, are shown in **Fig. 1** (DoCS, 2006). The tsunami height and inundation distance varied along the coastline depending on the bathymetry, coastal geometry and topographical features. The recorded tsunami heights (in m) along the coastline are given in **Fig. 2** (Samarawickrama et al, 2006). The inundation distances in northern and eastern areas reached 2-3 km inland and, in southern and western areas, reached 500 m in certain locations.

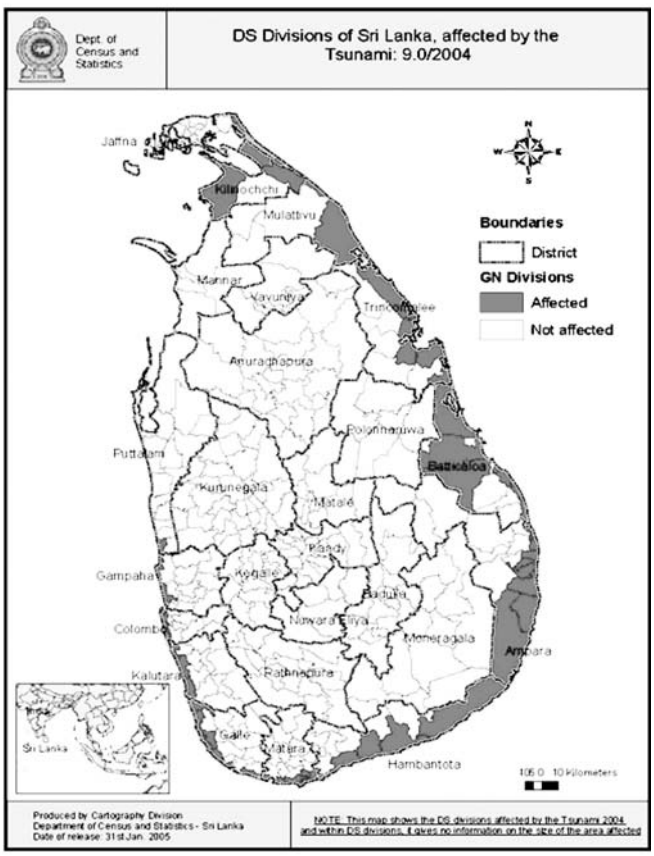

Fig. 1

2. IMPACT OF THE TSUNAMI

Sri Lanka, as a country, was totally unprepared for the disaster. No warning was given, no mitigation measures were in place, and the tsunami caused huge loss of life and extensive damage to

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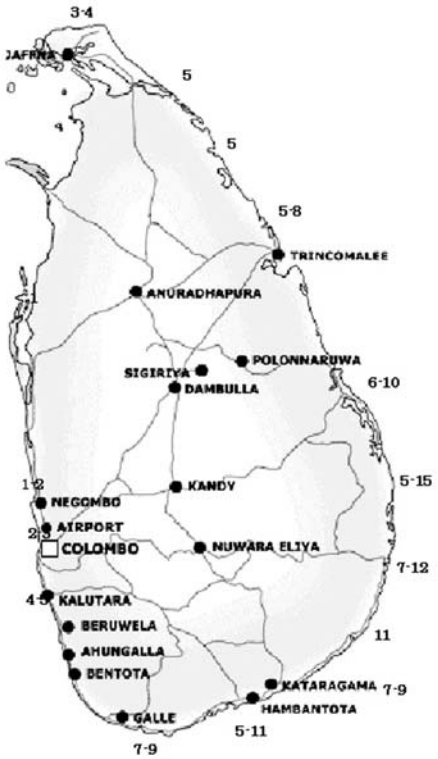

Fig. 2

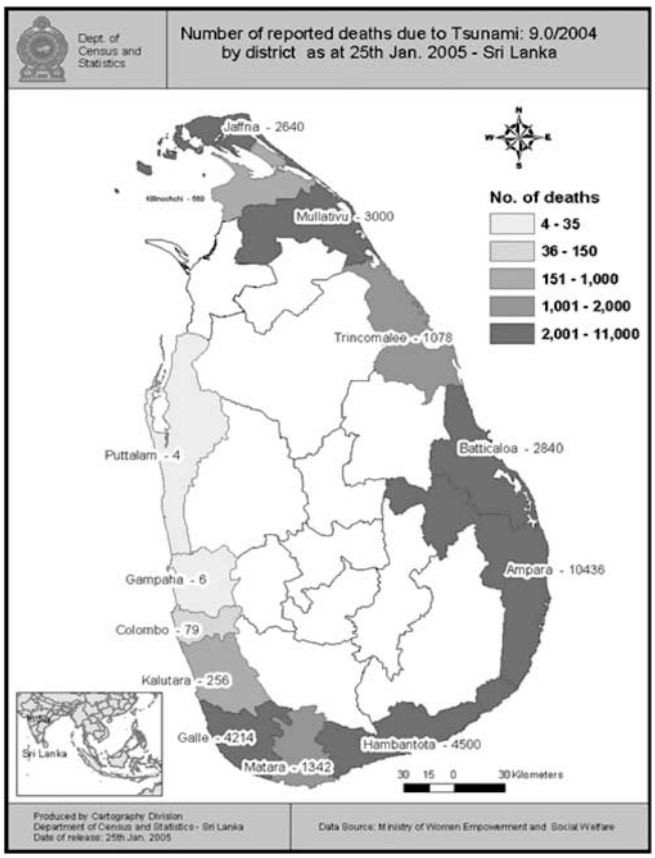

Fig. 3

coastal infrastructure and the environment.

The tsunami affected more than one million people out of a total population of approximately 19 million. More than 35,000 died (DoCS, 2006) as indicated in **Fig. 3**, 20,000 were injured, 5,000 remain missing and 500,000 were displaced. It also orphaned more than 1500 children, while over 150,000 individuals lost their livelihoods (MoFP, 2006).

Infrastructure facilities-houses, public buildings, schools, hospitals, hotels, fishery harbors, roads, railways, power, telecommunication, water supply and sanitation facilities in the coastal zone were severely damaged by the tsunami and access to certain remote areas was cut off for several days.

The seawater intrusion by the tsunami caused significant environmental damage. It also caused extensive soil erosion, damaged or destroyed coastal vegetation and contaminated inland water bodies, while the pollution of dug wells by seawater as well as wastewater from damaged infrastructure posed serious public health concerns. The onrushing waves also caused damage to natural protective systems such as coral reefs, mangroves and sand dunes, while the haphazard dumping of the shear volume of debris posed serious environmental concerns.

The total damage due to the tsunami has been estimated to be more than US $ 900 million, with a large percentage of damage concentrated in the housing, tourist, fisheries and transport sectors (ADB, 2005). The overall economic loss has been estimated at approximately 4.5% of Gross Domestic Product (GDP) and the tsunami impact was estimated to cause a reduction of GDP growth by 1% in 2005 (ADB, 2005).

The financial need for recovery has been estimated to be approximately US $ 2.2 billion (GoSL, 2005). In the short term, the major proportion of needs are in housing, transportation and livelihood restoration sectors. The needs are in proportion to the damages sustained and the recovery strategy, which may involve replacing the damaged assets with those of equal value, as in housing and health sectors or with upgrades as in transportation, water supply and sanitation and power services.

In summarized form the damage is given in **Table 1** (GoSL, 2005). The damage and the recovery made so far in the sectors most affected by the tsunami are also presented in this paper.

3. IMMEDIATE RELIEF AND RESPONSE

Immediately after the tsunami, hundreds of thousands of affected people sought refuge in nearly 600 places of temporary shelter, mainly schools and places of religious worship-temples, mosques and churches-and the task of providing them with the essential necessities was immense. Within hours, however, assistance started to pour in from local communities, followed by the government, private sector, non governmental organizations (NGOs) and international communities.

Emergency repairs to damaged infrastructure were carried out in parallel to the provision of essential services-accessibility, health and sanitation, water supply, power and telecommunication facilities-within a few weeks. Local and foreign military personnel also assisted in repair work as well as rescue operations, the identification and burial of dead bodies and clearing of debris. A scheme to provide food aid for nearly one million people and a compensation scheme for victims were initiated. Despite the sheer magnitude of

Table 1. Human, Economic and Social impact of the tsunami

Human	
Number of people killed	35,000
Number of people injured	21,000
Number of internally displaced people (IDP)	500,000
Economic	
Value of lost assets	US $ 900 million
Number of lost livelihoods	150,000
Number of houses damaged	100,000
Proportion of fishing fleet destroyed	75 %
Extent of salinated land	10,000 ha
Damage to tourism infrastructure	
Large hotels	58 out of 242
Small hotels	248
Related small enterprises	210
Roads	2100 km
Railways	135 km
Social	
Widowed, orphaned and affected elderly and disabled	40,000
Health facilities damaged	97
Education facilities damaged	
Schools	183
Universities	4
Vocational Training Centers	18
Schools used as camps for IDPs	444
Schoolchildren affected	200,000

the disaster and the lack of readiness of the country, thanks to the combined response, Sri Lanka recorded no additional deaths due to delayed medical attention or tsunami related illnesses.

The post tsunami recovery process was to be financed largely by foreign financial aid. Aid commitments by the international community reached nearly US $ 3 billion (Alailima, 2006) for the recovery effort and, in addition, the country received assistance in the form of debt relief/moratorium and exceptional trade benefits. There was also a significant contribution from local resources, in addition to the contributions made by the private sector and NGOs.

Recognizing the sheer magnitude of the disaster, coupled with the lack of previous experience, several response mechanisms were enacted to expedite the relief effort immediately after the tsunami. A Center for National Operations (CNO) was formed under the president to liaise with all involved with the emergency response and coordinate the relief effort. Three task forces were also formed under the president: Task force for rescue and relief, Task force to rebuild the nation and Task force for logistics, law and order, while disaster management authorities were appointed at district levels to coordinate local relief efforts. The structure of the coordination mechanism changed subsequently with the disbanding and/or merger of different agencies during the recovery and reconstruction period. In November 2005, all government agencies involved with tsunami recovery and reconstruction were merged to form a single agency, the Reconstruction and Development Agency (RADA).

Affected people were initially assisted through cash grants, food aid, and later through cash for work and microfinance schemes. Over 250,000 households received cash grants in installments, while nearly US $ 7 million was spent on the cash for work program in the first year after the tsunami. More than 13,000 subsidizing loans amounting to US $ 38 million had also been disbursed (GoSL, 2005).

4. DAMAGE AND RECOVERY, AND RECONSTRUCTION

4.1 Housing

The tsunami damaged or destroyed more than 100,000 houses, which amounts to 13% of the total housing stock in coastal administrative divisions. With total damage estimated at up to US $ 325 million, reconstruction needs are estimated to be up to US $ 460 million (ADB, 2005).

The people displaced initially took refuge in emergency shelter or with relatives or friends. As the capacity of the local con-

struction industry is about 50,000 housing units per year (GoSL, 2005), it quickly became clear that the construction of permanent shelters for resettlement would take time and that transitional shelters would be required to bridge the gap between emergency and permanent shelters. Such transitional shelters were expected to provide protection from the environment as well as secure living space and a base for restarting livelihoods. It was estimated that closer to 60,000 such shelters would be required (GoSL, 2005). It was possible to reach this target in one year although the quality of some of the transitional shelters failed to attain the required standards.

For the construction of a permanent shelter, a buffer zone was introduced as a safety measure. A coastal buffer zone also existed before the tsunami but was not strictly adhered to. After the tsunami, the government introduced a 100 m buffer zone in the west and south and a 200 m buffer zone in the east and north; restricting reconstruction. This led to two types of housing reconstruction programs- namely, donor built reconstruction to relocate the affected people from the buffer zone and a home owner driven housing reconstruction program for damaged and destroyed houses outside the buffer zone. Despite being introduced as a safety measure, the buffer zone became a crucial issue, due to the reluctance of fishing communities, tourists and commercial sectors for relocation, the scarcity of land for resettlement and the inadequate scientific basis for selecting the limits of the zone. It was subsequently relaxed in October 2005.

The total number of houses to be built under the donor built program is about 30,000 (MoFP, 2006) and under this program all affected families are entitled to a house built by a donor agency satisfying the standards specified by the government. The beneficiary will be the owner of the properties at the resettlement site as well as in the buffer zone.

Under the home owner driven program, affected houses are classified as either partially or fully damaged and the affected house owners are to be provided with cash grants (US $ 1000 for a partially damaged house and US $ 2500 for a fully damaged house) for the repair or reconstruction of their houses. These grants are to be provided in installments at different stages of the repair/reconstruction process. Further financial facilities-in the form of concessionary loans are to be provided for households having successfully utilized the disbursed grants. Nearly 35,000 houses were classified as partially damaged and 23,000 houses as fully damaged under this program, while the revision of the buffer zone resulted in an additional 14,000 houses falling within this program (GoSL, 2005).

The home owner driven program is funded by a group of major donors and has shown considerable progress in comparison to the donor driven program. By the end of 2006 nearly 12,000 fully damaged houses and 35,000 partially damaged houses had been completely rehabilitated under this program (MoFP, 2006).

Under the donor driven program, pledges for more than 65,000 had been made but, as of the end of 2005-one year after the tsunami-the number of houses completed was less than 5000 (GoSL, 2005) with only about 8000 more under construction. According to the government agency for tsunami reconstruction, only about 12,000 houses have been completed and nearly 13,000 were in different stages of construction by the end of 2006, nearly two years after the tsunami (MoFP, 2006) and falling well below expectations.

As of the end of 2006, more than 42,000 of the transitional shelters have been decommissioned, with nearly 15,000 shelters remaining occupied (MoFP, 2006).

It has thus become evident that the housing reconstruction efforts have not succeeded in reaching the targets set for various reasons. A lack of consultation among all stakeholders, unawareness of those affected of their entitlements, confusion caused by the revision of the buffer zone and the resulting additional demand for housing, escalation of the cost of building materials, limitation on the capacity of the local construction industry, escalating conflict in the north and east and the lack of sustained commitment of some of the donor agencies have contributed to the shortcomings of the housing reconstruction program.

4.2 Tourism

The tourist sector provides direct employment to about 50,000 while an additional 65,000 or so are employed in tourism related activities. It contributes up to 4% of the GDP and has shown growth since the ceasefire and peace process commenced in 2002, with more than 500,000 tourist arrivals in 2004 (ADB, 2005).

The tsunami caused extensive damage to the tourist sector, with total damage estimated at about US $ 250 million (ADB, 2005). Out of the 242 medium to large scale hotels registered, 105 are located in the tsunami affected areas, 8 of which were completely destroyed and about 50 partially damaged. In terms of rooms, about 3500 out of a total of 14,000 rooms were not in operation after the tsunami. Further, 1200 rooms out of a total of about 4000 rooms in small scale hotels/guest houses were damaged by the tsunami. The indirect effects such as loss of revenue, cash flow etc. are difficult to quantify but are likely to have a negative impact on the local economy.

Prior to the tsunami, tourist arrivals were predicted to reach 600,000 in 2005 but this was scaled down to about 400,000-500,000 arrivals, causing a loss of US $ 130 million in 2005 (ADB, 2005). Tourism in Sri Lanka is not confined to coastal areas and about 40% of the guest night stays are spent along the coastal areas affected by the tsunami. As many tourists prefer to visit coastal and inland areas, the tsunami was expected to adversely affect tourism in inland areas as well.

The lack of proper insurance cover for the majority of assets damaged by the tsunami has also adversely affected the reconstruction efforts. In most cases, the larger hotels have sufficient financial resources for reconstruction but the lack of such resources or insurance cover for smaller establishments had become a serious issue in the recovery process. Confusion regarding the interpretation of the buffer zone has also hindered the recovery program.

Assistance in the form of concessions in obtaining financial support and reconstruction materials was extended to this sector but complete recovery was expected to take longer, even when the damage was fully repaired, due to the overall devastation caused by the tsunami and the diminished attraction of these destinations.

By the end of 2005, only 11 of the damaged hotels remained closed (GoSL, 2005) and nearly 12,000 rooms were in operation. Tourist arrivals had increased by about 8% in comparison to 2004. As of the end of 2006, nearly 90% of the funds committed to this sector had been disbursed and expended, making it the sector with the highest percentage utilization of allocated funds (MoFP, 2006). It is expected that all large hotels damaged by the tsunami will be

in operation by the end of 2007.

4.3 Fisheries

The fisheries sector is one of those hardest hit by the tsunami. It contributes 2.4% to the GDP (ADB, 2005) and provides employment to a large proportion of the rural coastal communities, with more than 150,000 people directly or indirectly involved with this sector. The average annual fish catch is slightly over 250,000 tons and the output per fisherman is comparatively low. The average living conditions of fishermen are poor with income levels scarcely above the poverty line and the tsunami thus had a severe impact on the already improvised living conditions of fishing communities.

The tsunami killed about 27,000 fishermen (ADB, 2005) and about 90,000 in fishing communities were displaced due to damaged or destroyed housing. It also damaged nearly 75% of the boat fleet of about 28,000, consisting mainly of traditional non-motorized boats, single day motorized boats and a considerable number of multi day motorized boats. Most of the fishing implements such as outboard engines, ice storage, fishing gear and nets were also severely damaged, while a number of fishery harbors and anchorages were damaged by the tsunami. This includes the damage to marine structures, service facilities, equipment etc. and the fact that many harbors and anchorages required dredging and the removal of debris from the basins. In addition, many institutes in the fisheries sector suffered infrastructure and asset damages due to the tsunami. The damage in this sector, excluding that to housing and other assets in fishing communities, has been estimated at approximately US $ 120 million (ADB, 2005).

The fisheries sector has made a significant recovery since the tsunami, with the fish harvest reaching 70% of pre tsunami level at the end of 2006. All damaged boats have been repaired and 95% of the destroyed non motorized boats have been replaced, with most affected fishermen having resumed their occupation. Also 34 multi day motorized boats and 100 one day motorized boats have been handed over to the owners of destroyed boats, while 8 anchorages have been improved to date (MoFP, 2006).

4.4 Transportation

(1) Roads

The road network in Sri Lanka consists of national roads under the authority of the central government, provincial roads and local governmental roads assigned to provincial and local-municipal, urban and rural-administrations respectively. Local government roads are connected to provincial roads or within towns or municipalities, while provincial roads are connected to the national road network. There has been no significant investment in the road sector until recently and nearly 60% (ADB, 2005) of the entire road network has been estimated to be in a deteriorated condition due to the lack of maintenance and damage and neglect during the 20 years of civil war, particularly in the north and east.

The national roads suffered the most extensive damage by the tsunami. Long stretches of these roads are located in parallel, hugging the coastline and the tsunami damaged a total length of nearly 700 km, representing nearly 5% of the total national road network. Provincial roads, usually aligned at right angles to the coastline and heading inland to higher elevations, presented a lesser barrier to the onrushing wave and resulted in shorter inundation distances, suffering comparatively less damage. As with provincial roads, the damage was less severe in local government roads. It has been estimated that a total length of 300 km of provincial roads and 1100 km of local government roads, representing 2% of the combined total, was damaged by the tsunami. Moreover, several road bridges, mainly on national roads, many culverts and road furniture suffered severe damage. In addition, several road ferry services and associated infrastructure suffered damage by the tsunami. In the east, coastal roads were severely damaged by heavy rain and flooding immediately prior to and after the tsunami and it was difficult to segregate the damage caused by the tsunami. The total damage in the road sector was estimated to be approximately US $ 80 million (ADB, 2005).

Immediate repair of the damaged roads was a priority to enable relief and urgent necessities to reach the affected communities. The southern highway and the northern coastal roads and bridges were repaired and reopened within a week after the tsunami. The east coast highway was reopened for traffic by mid January 2005.

In terms of recovery, the short term need was to consolidate the repairs carried out before the onset of the next monsoonal season. It was estimated that the associated road works could be completed within a contract period of about 6 months but certain bridge replacement works would extend into the 2006 construction season. Following the short term work, the medium term need involved putting the national roads into a uniform standard, free from seasonal flood damage and erosion. It also includes the reconstruction of provincial and local government roads which are significantly deteriorated. The total short and medium term recovery needs are estimated to be US $ 21 million and US $ 157 million respectively (ADB, 2005).

The donors were quick in committing funds for road rehabilitation. 5 major bridges on the main southern coastal highway have been completed and major bridge rehabilitation work in the East is underway. Almost all road rehabilitation projects are in progress, even though the completion dates have been extended to 2007. As of the end of 2006, more than US $ 42 million (MoFP, 2006) had been spent on the recovery effort and it is presently estimated that the overall costs will remain within those initially estimated.

(2) Railways

Rail corridors in Sri Lanka extend from the capital Colombo in the west to the north, northeast, east, south and the central highlands. The tsunami caused disruption to rail services in the northeastern, eastern and southern corridors, but the damage to the northeastern and eastern corridors was minor in comparison with the severe damage to the southern corridor. The southern corridor carries about 78,000 passengers per day, mainly commuters, as well as bulk freight from the southern port of Galle. Of a total length of 160 km of this corridor, a length of 135 km was affected with approximately 20 km of track suffering severe damages. This damage also prevented the damaged rolling stock from being returned to workshops for repairs. The total damage to rail track, railway infrastructure and rolling stock was estimated to be US $ 26 million.

The minor damages in the northeastern and eastern corridors were quickly repaired and rail services resumed in mid January 2005. The short term needs in the southern corridor for the restoration of services to pre-tsunami levels were estimated to equate to

US $ 71 million over a period of 4 months. Due to the traditional reliance of most commuters on rail transport and the lack of alternative modes of transport, the restoration of rail services in the southern corridor within 60 days was give highest priority and it was possible to achieve this target in 57 days (Fernando, 2006), which is considered as an important achievement in the tsunami recovery effort.

4.5 Agriculture and Livestock

Many families in almost all districts affected by the tsunami depend on crop agriculture and livestock as primary or secondary sources of income. These activities are usually conducted at subsistence level rather than on a commercial scale. The main agricultural areas are located inland and there are very few large livestock farms located in the areas affected by the tsunami. As a result, the overall damage in this sector is comparatively less, although many families have suffered a loss of income levels.

The damage in this sector is mainly due to the destruction of rice and other crops and home gardens along the coastal belt. More than 2000 ha of rice fields, 1000 ha of other crops and about 2500 home gardens were destroyed by the tsunami. The inundation of agricultural land by seawater has caused high levels of salinity making them unproductive for 3-4 years until the salinity is reduced by seasonal monsoonal rains. It has been reported that nearly 10,000 livestock animals were also killed (ADB, 2005).

In terms of agricultural infrastructure, although no large irrigation schemes are located in coastal areas, a large number of salt water exclusion structures are located along the coastal belt. These structures are used to prevent seawater entering cultivated areas through drainage canals-mainly in the dry season. The tsunami has damaged many of these structures and eroded and clogged the drainage canals with debris. In addition, infrastructure facilities belonging to various institutions in this sector were also badly damaged. The total damage to the agricultural and livestock sector is estimated to be about US $ 3 million (ADB, 2005).

The immediate needs were to include the affected people in cash grant assistance programs and to provide financial facilities to restart their livelihoods. In the long term, recovery efforts were to be focused on the repair and reconstruction of the damaged infrastructure and the provision of technical assistance to accelerate the recovery of agricultural production. The estimated cost of recovery in this sector is approximately US $ 4.3 million (ADB, 2005).

As of the end of 2006, it has been reported (Fernando, 2006) that 75% of the total land used for rice cultivation and 84% of that used for other crops are back in production. Soil salinity, labor shortages and a lack of financial resources-particularly in the eastern districts-have contributed to the shortfall to the complete recovery.

4.6 Power Sector

No major infrastructure in the power sector were located in coastal areas and the damage in this sector was limited and marginal; mainly confined to medium and low voltage distribution lines. About 50 km of medium voltage distribution lines (11KV and 33 KV) and 400 km of low voltage lives were destroyed, disrupting electricity supply to approximately 70,000 households representing 2% of the total. The total damage in this sector was estimated at about US $ 9.4 million (ADB, 2005).

The immediate recovery needs involved commencing temporary repair works, prioritizing the restoration of supply to water supply facilities, hospitals and shelters in order to meet humanitarian needs. It was possible to restore the electricity supply in the affected areas within 2 months. The short term priority involved restoring the supply to the affected households and to expand the distribution network to supply power to the housing that will be provided for the affected population, for which the financial need has been estimated as approximately $ 27 million (ADB, 2005). The provision of electricity to resettlement sites depended on the progress of construction and as of the end of 2006, nearly 18,000 new houses have been provided with electricity (MoFP, 2006).

4.7 Water Supply and Sanitation

Due to water resource scarcity and the damages caused to the water delivery systems by the civil war, many of the tsunami affected areas had experienced water shortages even before the tsunami. In the affected areas, the dependence on wells is high and more than 60,000 wells were damaged by the tsunami inundation. The damage to water supply schemes was restricted mainly to the distribution network close to the shoreline, with 9 such networks reported to have been damaged. Damage to sanitation facilities mainly included household latrines, which in many households are located separately, and some infrastructure associated with sewerage works, with total damage in this sector estimated at approximately US $ 40 million (ADB, 2005).

Some of the affected wells were recoverable while the others had to be abandoned due to heavy contamination by seawater. More than 12,000 wells needed to be cleaned and potable water was supplied by dowsers in areas where the water supply schemes were not in operation. Quick repairs to damaged distribution networks were also performed, restoring them to operable levels but sometimes with restricted supplies.

It has also been observed that well supply will not be a significant water resource in certain coastal areas and expansion of water supply facilities will be needed to meet the growth in demand. Due to the relocation of communities, some existing networks need to be expanded and parts of them have become redundant.

4.8 Health Sector

The damage to the health sector by the tsunami was significant with losses to both infrastructure and personnel. More than 90 health institutions, including hospitals, drug stores and health centers were damaged or destroyed by the tsunami. Losses also included medicine and medical equipment. These losses and that of health personnel caused a total breakdown of health services in the affected areas. The estimated cost of damage in the health sector was approximately US $ 57 million (ADB, 2005).

The immediate health need was to provide basic health care to the affected people. Providing clean water to emergency shelters and health institutions and taking measures to prevent the spread of communicable diseases among those affected were also among the urgent needs. The disaster caused considerable trauma among the affected people and it became urgently necessary to implement a program addressing their psychological needs. The provision of temporary health facilities and strengthening of unaffected health facilities to expand the service to provide health care to the displaced population were among the short term needs. The estimated

cost of rehabilitation of this sector was estimated to be US $ 79 million (ADB, 2005).

The efficiency of the health sector has managed to halt the spread of disease among the population affected by the tsunami. It has also been successful in mobilizing sufficient resources for the recovery effort, with much higher commitments than the extent of the damage having occurred. Satisfactory progress has been made in small scale construction, with the renovation of buildings and primary health care facilities almost completed. However there have been major delays for larger construction projects with 50% of the construction work yet to begin. As of the end of 2006, approximately 23% of the financial commitments had been utilized in the recovery and reconstruction effort (MoFP, 2006).

5. EDUCATION AND AWARENESS FOR DISASTER MITIGATION

The tsunami damaged 183 schools, 18 vocational and industrial training institutes and 4 universities, affecting the studies of nearly 100,000 students. The majority of the damage was to primary and secondary schools with buildings in 57 schools completely destroyed. Concerns have also been raised with 91 schools, which were damaged or destroyed and which are located too close to the sea, with the cost of damage to the education sector estimated at approximately US $ 21 million (ADB, 2005).

The urgent need in this sector after the tsunami was to repair the facilities to enable the students to recommence their studies. The damage to the universities was minor in comparison and academic activities resumed soon after the tsunami. Apart from the damaged schools, it was also impossible to recommence academic activities at 444 undamaged schools which had been used as temporary shelters for displaced people, affecting the studies of a further 100,000 students. It was necessary to clear these camps and when the reconstruction was likely to be delayed due to the extent of the damage or the need for relocation, to provide temporary shelter to conduct classes. The cost of short term construction and restoration process, with quality upgrading in the education sector, was estimated at US $ 42 million (ADB, 2005).

One year after the tsunami, nearly 95% of the school children in the affected areas had returned to school although only a low percentage of education facilities had been fully repaired. As of the end of 2006, approximately 57% of the damaged schools were in various stages of construction but only 10% of the construction had been completed. Among the schools used as temporary shelters, 34% were undergoing rehabilitation with about 9% completed (MoFP, 2006).

6. LIVELIHOODS

Over 150,000 people lost their livelihoods due to the damages caused by the tsunami: 50% in the fisheries sector, 45% in the service sector and 5% in the agricultural sector respectively. Approximately 80% of those affected lost their main source of income and 90% lost their productive assets (ADB, 2005).

The short term priorities in this sector included creating and restoring the income generating capacity of the self employed and small scale businesses, creating employment in all the affected areas and providing training and business development services. In the longer term, it will be necessary to focus on the alleviation of poverty, the provision of financial assistance to obtain the benefit of new business opportunities and adopt new higher productivity technologies. The initially estimated cost of restoration of livelihoods was approximately US $ 140 million (ADB, 2005).

The livelihoods recovery program consisted of providing cash grants, asset distribution through the provision of productive tools, providing cash for work and providing access to micro financing systems.

Over 250,000 households started receiving cash grants of up to US $ 2000 in 4 installments, to supplement the food rationing program of US $ 3.5 per week. Under the cash for work programs, more than US $ 7 million has been spent, with the initial focus on the clearing of debris and implementation of other emergency repairs, followed by road and irrigation infrastructure rehabilitation (GoSL, 2005).

The concessionary loan schemes for restarting micro, small and medium enterprises were implemented by the central bank and many other organizations and in the first year, nearly US $ 36 million was disbursed to nearly 8000 borrowers under the central bank scheme (GoSL, 2005).

According to available data, up to 85% of the affected families had regained their main source of income one year after the tsunami. A survey reveals that, as of the end of 2006, 95% of women and 84% of men who lost their income are earning an income which is also significantly higher than their previous income levels. (MoFD, 2006).

7. DISASTER RISK MITIGATION

Although Sri Lanka had been free from any major disaster before the tsunami in 2004, floods and landslides in 2003 and various other small to medium scale disasters in recent years have highlighted the fact that Sri Lanka is a disaster prone country. These disasters have caused loss of life, property and environmental damages adversely affecting the development activities of the country. It has therefore become important to consider the risk of disasters in all development programs and the government has launched a number of initiatives to strengthen the disaster mitigation capacity of the country.

In the aftermath of the tsunami, a parliamentary select committee was appointed to investigate the preparedness of the country to face emergencies and to make recommendations to minimize the damage caused by various disasters. Based on the recommendations made by the committee, the Disaster Management Act was enacted by the parliament in May 2005. Under this act, the National Council for Disaster Management (NCDM) was established as the main body responsible for disaster risk management in Sri Lanka. The ministry of Disaster Management and Human Rights as the leading ministry and the Disaster Management Center as the executing agency for disaster risk management were also established by the directives of the NCDM.

An interim committee for early warning was formed soon after the tsunami to establish an early warning system for Sri Lanka, while several other committees were also established at a national level to prepare responses and mitigate future disaster risks. In addition, committees at district, divisional and village level were also established for early response and preparedness for disasters

and the capacity building is continuing at present.

8. CONCLUDING REMARKS

The post tsunami recovery process in Sri Lanka is briefly presented in this paper. It discusses the progress of the recovery process in terms of the thematic areas around which the recovery and reconstruction activities are organized: getting people back into homes, restoring livelihoods, services-education, health etc, and national infrastructure development. It has become evident that despite being by no means complete, the recovery process has made some significant progress in certain sectors affected by the tsunami. At this juncture, two yeas after the tsunami, it may be useful to carry out a critical assessment of the strengths and weaknesses of the recovery process so far, in order to reach the objective of complete recovery at the earliest possible time.

Such an assessment needs to look into the effectiveness of the measures taken to overcome the identified weaknesses of the recovery process. Concerns had been raised regarding the transparency, equity, communication and coordination between stakeholders involved, effective monitoring and measuring the progress and the capacity of the implementing organizations of the recovery process. There is also a need to address the issues that currently dominate. Among these issues are the escalation of violence in the north and east, which has slowed the reconstruction activities and increased the number of displaced people, the inferior quality of the assets provided, due to the initial focus on only the quantity of tsunami disbursements, and the maintenance of the institutional and financial sustainability of the stakeholders, due to the lack of sufficient resources.

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