Rehabilitation

THE PROCESS

The relief phase was more people driven, family centered, providing for basic day-to-day and immediate needs of the affected population. A breather to the tsunami affected in the form of temporary relief packages served to give them confidence to live and strength to rebuild their lives. The ongoing rebuilding is however a much more complex procedure with well-meaning, but conflicting concerns and multiple stakeholders involved. To be able to quantify damage and do a needs

assessment sector by sector and to achieve the desired clarity on issues regarding reconstruction and resettlement, permanent housing, livelihood and infrastructure, the timeline and the content of rehabilitation, the state government held consultations with the beneficiaries, community leaders, local and district administrators, representatives from other states, NGO representatives and donor organizations. This way the state could link the international and national experience (as in post earth quake Gujarat) in handling post disaster reconstruction, and crystallize a policy informed by local conditions and customs.

SHELTER

A series of workshops and training programmes were also held on environmental and social management aspects, disaster reconstruction, infrastructure needs assessment and appropriate technology for rebuilding infrastructure and houses in the tsunami affected areas. Housing the homeless being the first priority, consultant engineers and other technical staff got together with government officials in several workshops to detail guidelines for disaster reconstruction. The workshops aimed to create awareness among field engineers and NGOs about the precautions to be taken for construction, testing of materials, quality control, quality assurance, and other infrastructure like water supply, sanitation, road, rainwater harvesting, sanitary arrangements on construction site, construction of rural roads and rigid pavement roads. It was emphasized that the houses should be disaster resistant.

The main feature of the housing project of the State government is that it is owner driven, giving besides a sense of safety, a sense of belonging to the place and occupation. The fishermen communities in the tsunami-affected areas were faced with the tough decision of balance between safety and livelihood. While safety concerns required them to move inland, their livelihoods forced them to be at the shoreline.

To resettle the affected, the Tamil Nadu Government formulated the housing policy under which permanent shelters will be built as per the Coastal Regulation Zone notifications through public–private partnerships in terms of

MOUs between the District Collectors and NGOs/Corporates undertaking construction of houses in the respective districts. The State government decided to give the newly constructed houses worth Rs 1,50,000 with a built up area of 325 sq.ft. each free of cost, to those fishermen who were ready to shift beyond 200 m of the High Tide line. Those who weren't willing to relocate beyond 200 m were however allowed to repair authorized structures developed prior to 1991 in the CRZ without any government assistance. Three cents of (1 acre = 100 cents) land in rural and 1.5 cents in municipal areas were provided, free of cost. Wherever agencies did not come forward, house owners were permitted to construct with the assistance of District Collectors. Similarly, where NGOs were not available or in non-NGO operational areas, the State Government decided to build the houses for the deserving families through SHG's of beneficiaries.

For availing the new houses, old houses need to be relinquished to the Government through legally acceptable documents. Vacated land would be entered in the Prohibitory Order Book at village and taluk revenue accounts and maintained for public purposes. The fishing community is being allowed to keep their boats, nets, etc in this area with a view not to disturb their livelihood patterns. New houses are built as per technical specifications of government for safety and durability. Insurance coverage would be given to the families for new houses for a period of 10 years. The Government of Tamil Nadu provided the guidelines for ensuring the quality of construction paving the way for durable and disaster proof habitat development. The layout was planned with adequate infrastructure like water supply, streetlights, road, rainwater harvesting structures, drainage, community centre, noon meal centre, etc. Legal ownership of the house is made in the joint name of husband and wife, or the survivor, or the eldest surviving child.

Overall 89,206 permanent houses have been planned for reconstruction across the State. 7670 houses will be repaired. 53,562 houses (45,892 fully damaged and 7670 partly damaged) will be reconstructed/repaired in first phase. NGOs have repaired 3953 houses and about 32,552 houses are being built by NGOs/TNSCB.

PRESENT STAGE OF HOUSING

The first phase of construction of 45,892 dwellings will be completed by March 2006. As on 22.12.2005, 5135 houses have been completed - 1053 in Nagapattinam, 415 in Cuddalore, 981 in Kanniyakumari, 468 in Tiruvallur, 2200 in Chennai and 18 in Villupuram. The second batch of 43,314 houses, which are not damaged, but fall within 200 m of the high tide line will be taken up thereafter.

	Hectares	Locations
Acquired	485	164
Negotiations in progress	97	23

LAND ACQUISITION BY THE STATE GOVERNMENT FOR HOUSING

All the housing colonies / habitations are completed only with access roads, assured water supply, sanitation facilities, street lights including solar street lights, community centres and *anganvadis* where necessary.

Cuddalore has been the first district to hand over completed houses

CHECKLIST ON QUALITY MAINTENANCE FOR SHELTERS

Site selection: Foundation depth should be based on bore log tests and not based on the guideline which is minimum required in good soil.
Foundation: The anchor reinforcement should emanate from the bottom of the foundation.
Cover to steel: Cover blocks of proper size and quality should be used.
Quality of water: The quality of water used for construction should be tested and the test report or record available at site.
Testing: Periodical cube tests should be made and the results available at site.
Compaction of concrete: Concrete should be well compacted especially around the bars.
Bar bending: The hooks for stirrups should be bent through 135 degrees. The vertical bar should be at the centre of the wall and should not be kinked from the corner. The kink at laps should not be more than 1 in 6 slope.
Septic tank size and location: The capacity of the septic tank should be properly designed for the number of persons using the house. The actual type of sanitation will depend upon the open space availability, nature of soil, ground water level and the number of families.
Test on Steel reinforcement: The steel reinforcement used should be tested for quality.
Quantity of water: A record should be kept for the quantity of water used for construction and the correction applied for moisture present in the sand.

to the tsunami affected built by Mata Amritanandamayi Math. 17,461 new houses covering 80 habitations were taken up by 43 NGOs in Nagapattinam. The communities were also encouraged to go in for *in-situ* construction beyond 200 m from the sea so as to retain the layout of the earlier habitation. In some habitations such as Keechankuppam, the suggestion was to go for G + 1 (Ground + 1 floor) so as to save space. The designs of these houses differ from place to place, according to soil condition and the desire of the people of that area. In Chennai and Tiruvallur districts, multi-storied houses of Rs 1,50,000 each with 235-250 sq. feet are planned.

Fishing Implements	Fully damaged	Replaced	Partly damaged	Repaired
Catamarans	15522	1042	10595	10595
Vallams	357	0	3813	3813
FRP Catamarans	513	258	2889	2889
Mechanized boats	383	18	2008	1694
Fishing nets	38177 units given			
Out board motors			2776	2776

RESTORATION OF LIVELIHOOD

FISHERIES SECTOR

Relocation in the new houses have given the fisher families a new sense of safety, access to privileges that they never had and freedom from fear of being close to the sea. However, without getting back to the occupation where they belong, their resettlement would be incomplete.

LOSSES/REPAIR/REPLACEMENTS

Apart from the subsidy amount that was given to the fishermen by the Government of Tamil Nadu, as a long-term measure, linkage was given by the government between the fishermen and the banks for loans to the tune of Rs 47 crore to about 2000 fishermen for repairing / replacing their fishing craft. The State Government has exempted fishing gear from Sales Tax. The restoration of 8 ports, 15 fishing harbours and innumerable fish landing centres are being restored. Besides supporting the fisher communities with the fishing implements, they also had to be given psychological strength to dare the sea again. Some of them are exploring

alternative livelihood options. The district administrations are helping the fishermen, agriculturists and horticulturists who have lost their traditional livelihoods due to tsunami with innovative livelihood alternatives on the lines of SHGs. Groups of fisherwomen were also trained and seed funding given to start businesses using those skills.

AGRICULTURE

An extent of 8460.34 hectares of agricultural land was saline affected. Farmers have been trained through Krishi Vikas Kendras. Soil samples were taken periodically to monitor the progress of reclamation. The main feature of the implementation strategy was to form Tsunami Farmer's Self Help Groups (TFSHG's) in each area consisting of up to 30 members who shall undertake all the activities relating to the reclamation of the soil affected by tsunami during the project period. At the moment the entire affected land has been reclaimed. So far, 5880.96 hectares are sown with salt tolerant paddy crops and the balance land will be sown with oil seeds soon. Among others the main features of the relief programme for the agriculturists are: The development and application of site-specific soil management technologies to restore the soil productivity and protect the environment, restoration of livelihood opportunity to the farmers whose lands have been degraded by tsunami, restoration and creation of irrigation infrastructure to sustain agricultural activities and capacity building among the farmers in different aspects of tsunami affected soil reclamation technologies.

The technology assistance package for reclamation of land includes: Scraping and removal of silt, levelling of the land surface, salinity being the main problem, wherever possible, leaching with good quality water three or four times at short intervals to restore soil health, application of gypsum where necessary, arrange sufficient water in one irrigation to leach salts to depths beyond the root zone, treating the surface with liberal addition of organic manures or insitu ploughing of green manures like *Daincha* or *Sunhemp* to

improve the soil physical condition and help to maintain the soil buffering capacity and twenty per cent extra seed supply to ensure better germination.

HORTICULTURE

An extent of 669.82 hectares of horticultural land was affected and it has been recovered. Soil sampling, soil removal and green manure application has been completed. Fruit saplings will be planted soon. So far, 138 SHGs have been formed with 20 members each. The individual and family centric rehabilitation programmes are being complimented by rebuilding the public facilities and restoration of common resources.

INFRASTRUCTURAL FACILITIES

Public Works Department - Out of 414 totally damaged Public Buildings, 91 were School Buildings, 71 relate to Health services, 7 public office buildings, 114 cyclone shelters and 131 relate to the Animal Husbandry Department. Repair and reconstruction works of these buildings is underway.

BASIC AMENITIES

Some of the NGOs constructing permanent houses for the tsunami-affected families agreed to provide the basic infrastructure facilities like roads, drainage and electricity in the new habitations that were coming up in many locations along the coastline. Bulk of the infrastructure facilities are being provided by the Government. Directorate of Special Village Panchayats, Commissionerate of Municipal Administration, Tamil Nadu Electricity Board, Tamil Nadu Water Supply and Drainage Board and Tamil Nadu Maritime Board have undertaken infrastructure development works all over the affected areas.

RESTORATION OF SEAPORTS

Tsunami played havoc on the Cuddalore and Nagapattinam minor seaports under the control of the Tamil Nadu Maritime Board by way of the silting up of the entire Uppanar river in Cuddalore District and Kaduvaiaru river in Nagapattinam District. This impeded the navigation of boats and other vessels of the respective ports. Restoration works at

Cuddalore and Nagapattinam Ports were undertaken. In addition to the above, a huge dredging operation in fish launching areas in River Kaduvaiyar was done using machineries to resume the fishing activities by mechanized boats.

WATER RESOURCES ORGANIZATION

Repair works will be carried out for 1 Regulator, 113.1 kms of river drains and 49.85 kms riverbanks. Out of 23 drains and river confluences with Bay of Bengal in Nagapattinam district, 15 drains and rivers were identified as worst affected which require immediate restoration. The worst affected drains and rivers are taken up for strengthening the banks to superior standards to avoid further damages due to saline water intrusion. Some of the damaged regulators and canals will also be repaired.

RESTORATION OF SEA COAST AND PREVENTION OF SEA EROSION

The unexpected invasion of tsunami had eaten away large chunks of bewitchingly beautiful seashore along the Coromandal Coast. It had caused substantial damage leaving in its trail the daunting task of restoring sea erosion. The Water Resources Organisation of the PWD implemented massive and immediate repair works and also carried out preventive measures to mitigate the damages from similar dangers in the years to come.

RESTORATION OF ECOLOGY AND DEVELOPMENT OF MANGROVE FORESTS ALONG THE COAST LINE

Natural mangrove forests and sand dunes have been acknowledged as the natural barriers to tame the raging waves caused by sea-borne disasters like tsunami to shield the land from the ravages of such disasters and to mitigate loss of human lives and damage to the public and private properties to the barest minimum. This fact was proved by the minimum damages caused to Medavamedu village, which has plantations along the coastline. Moreover with the coastal areas of Tamil Nadu which were rich with mangroves, the impact of tsunami was the minimum. Mangroves protect the shore from the sea and the sea from the shore besides enriching the ecosystem. The State Government has made provisions for raising shelterbelt plantations in 13 coastal districts. An area of 2000 hectares had been identified in the tsunami affected coastal areas. The state government has also made provision for mangrove plantation in Muthupet area. Nursery work has been completed, area finalized and plantation is in progress.

TRAINING AND ORIENTATION FOR CONSTRUCTION PROFESSIONALS

Workshops and training was conducted for architects, masons and engineers to facilitate construction of disaster resistant buildings. The state has also prepared a construction manual to be followed for the new constructions in the affected areas. Training covered environment and social management, disaster reconstruction, disaster resistance features of buildings, quality control and quality assurance, water supply and sanitation, rainwater harvesting and building material technology.

DISASTER PREPAREDNESS

Disaster management is one of the most important global issues today. People need to be extensively taught on disaster prevention, control and mitigation. Tsunamis and earthquakes of this measure cannot be predicted. But adequate short term and long-term disaster mitigation measures can be put in place to minimize the loss of precious human life and thus reduce their impact. In order to create an environment of disaster preparedness, the following activities have been undertaken.

Mock drills related to tsunami, with the participation of District level line Departments were conducted. In some places, Emergency Operation Centres are planned to cater to the needs of emergency operations in the near future. In all the Blocks, an emergency/disaster preparedness plan has been prepared and sensitization in this regard is being carried out. Village level plans for disaster management have been encouraged. Village level sensitization meetings have been completed for all the blocks in the district of Kanyakumari where participants from various sectors of life took part.

SOURCES OF LONG TERM FUNDING AND ASSISTANCE TO THE STATE GOVERNMENT INITIATED RELIEF AND REHABILITATION

Agency	Fund	Project	Sectors
World Bank	US$ 423 million(Rs.1852 crores)(3 years)	ETRP(Emergency Tsunami Reconstruction Project)	Housing, infrastructure, fisheries, horticulture, animal husbandry, environment, mangroves, shelter belt plantations and repair of public buildings
Asian Development Bank	US$ 143 million(Rs.629.63 crores)(3 years)	TEAP(Tsunami Emergency Assistance Project)	Livelihood promotion, transportation, restoration including brid ges, ports and harbors, rural and mumuniciple infrastructure, water supply, sanitation, capacity building
International Fund for Agricultural Development	US$ 30 million(Rs 129 crores)(8 years)	Post Tsunami Sustainable Livelihood Program	Community resource management, community institutions, micro and rural finance and microenterpricse development
UN recovery frame work			Improving standard of living, health, education and environment of affected communities, social equity and gender empowerment.
NGOs			Contribution to relief material, boats, nets, training programs, psy chosocial care camps and housing- cost of each house is around 1.5 lakhs. Land and infrastructure is being provided by the government.
Prime Minister's NationalRelief Fund	Besides ex gratia payment for the kin of dead persons, a proposal of Rs 23.25 crores has been made		Exgratia payment: 1 lakhto the next kin of every deceased person Other Assistance: Education, social welfare, economic assistance, for livelihood restoration and health.
86 Members of Parliament from 15 states	Rs 1.71 crores		Education, Vocational Training, Social Welfare, Health, Inf rastructure and related facilities.
Government of Rajasthan	Rs 17.84 crores		Infrastructure, facilities, health, education, social welfare, livelihood assis tance for fisher community, rural development
Government of Gujarat and Government of Chattisgarh	-	-	Construction material, family kits, food grains, funds to CMPRS

RESTORATION OF HISTORICAL AND ARCHAEOLOGICAL SITES

A major tourist attraction, the 133 feet tall, Tiruvalluvar statue at Kanyakumari maintained by Tamil Nadu Tourism Development Corporation and protected monuments located in the coastal belt of Kancheepuram, Nagapattinam and Thanjavur Districts and also some structures of archaeological importance suffered damages due to tsunami. Repair and Restoration works of these protected monuments and structures is one of the tasks facing the State Government. While the Tourism Development Corporation and Poompuhar Shipping Corporation have restored their facilities, the other sites are to be improved with expert guidance.

The rehabilitation and restoration initiatives so far accomplished and those slated for another two years have been supported by financial assistance from international and national agencies and other state governments besides the funds of the state government.

The Government has drawn up a comprehensive plan for development of the coastal areas ravaged by Tsunami. It consists of several noteworthy initiatives, which cover not only physical components but also addresses gaps in the human resource domain: Strengthen the connectivity in coastal areas, construction of link roads, bridges, to catalyze the economy and increase disaster preparedness, disaster preparedness programmes at community level by training programmes – not confined to fisheries.

It also aims to stabilize the current and broaden livelihood option and strengthen the coastal ecology by measures such as shelterbelt plantations, mangroves, etc.

TECHNOLOGY PERVADES

1. **Uniform Building standards – Disaster resistant features covering earthquake, floods, etc. with close monitoring of quality control.**
2. **Steel Boats being made instead of mechanized wooden boats.**
3. **Extensive use of internet for information dissemination and reporting.**
4. **Desalination and other drinking water solutions.**
5. **Solar lights – 4000 lanterns by solar energy.**
6. **Use of building materials like micro-concrete tiles, compressed stabilized Earthen Blocks, fly-ash cement blocks / bricks.**
7. **Use of excavators / JCBs, earth-movers, etc. in the relief and rescue operations.**
8. **Use of Gabions in all coastal protection measures like sea walls, groynes, etc.**
9. **Use of wireless sets in all the coastal panchayats, vehicles and offices.**