Chapter 6

Summary, Conclusion and Remedial Measures based on Coast Zone Regulation Concept

6.1 Introduction

Tamil Nadu is the worst affected state in India due to the Asian Tsunami. Around 8,000 people lost their lives on Dec 26th and many of them are missing still. Of all the districts affected, Nagapattinam coast zone stands atop as the worst affected area with a death toll of 6000. The seawater's intrusive aggression was traced from 300 meters to 3 kilometers which had affected majority of the coastal communities in this district. The hefty waves made stones and pebbles out of the 51 fishing hamlets along the coast zone; the permanent and temporary constructions, boats, catamarans, fish landing and auction centers, marine machines and freezer plants were floored to size. Large-scale damages were reported due to the coastal sand inundations and seawater intrusions. The present study has been designed to assess the post tsunami impact on coastal hamlets, particularly the hamlets namely, Nambiyarkuppam, Akkaraipettai and Keechankuppam, the ones that had received the worst of impacts. These are very adjacent to the coastline. To study the post tsunami impact, to assess the damages caused to these hamlets, IRS P6 digital data is used. For the disaster assessment purpose the coastal huts, settlements with thatched sheds/ metal sheets, vegetation cover along the coast, wet land conditions,
sand inundation levels, sea water intrusion levels, widening of river mouth and inland water areas were taken as important evidences so as to decipher the intensity of the disaster. From the maps, the level of intrusion, sea sand inundation, the affected zone information are extracted and can be well understood to give suggestions to the District Administration in the task of planning ahead for the resettlement of the coastal communities in this region. To study the post tsunami conditions, the relief and rehabilitations provided by the Government Agencies are gathered and mapped. Permanent and temporary rehabilitation shelters in the sample coastal villages are mapped using GPS survey. The water intrusion level maps are generated and the GPS points of the location of the permanent shelters have been overlaid. Finally the distance from permanent shelters to the sea shore have been derived using buffer analysis and the vulnerable habitations in which the permanent shelters had been constructed at a distance less than five hundred meters have been identified to predict and prevent any future disasters/ damages.

Environmental issues have always been the point of debate in shrimp farm development. While the harvest from capture fisheries around the world has stagnated, aquaculture is viewed as a sound option to increase fish production, and play a vital role in providing food and nutritional security. However, the shrimp-farming sector has been strongly opposed by environmental groups on many occasions, not only in India but in many other countries around the globe. Legal interventions have been sought to curtail shrimp culture, to preserve the coastal environment and the ecology. Though the polarisation of opinion on the adverse impact of aquaculture in the nineties was very strong, there are signs of more
tolerance to accommodate diverse views and opinions lately and allow development of shrimp farming in an environment-friendly and sustainable manner. In India, commercial shrimp farming started gaining roots only during the mid-eighties. It was a relatively late start in India; by this time, shrimp farming had reached peak in most of the neighboring Asian countries, especially China and Taiwan; in some the disease and poor farm management practices had already taken a heavy toll. The boom period of commercial-scale shrimp culture in India started in 1990 and the bust came in 1995-96, with the outbreak of viral disease. The fact that most of the coastal States in India were new to commercial-scale shrimp farming, the general ignorance of good farming practices, and the lack of suitable extension services, led to a host of problems.

The Nagapattinam coast zone has already been polluted due to the outlet of farm wastewater and many scientific studies proves this fact. The destructive activities of tsunami 2004 has aggravated this problem, due to the intrusion of sea water and the destruction of ponds and this has affected the coastal aquaculture small farmers and the environmental conditions of this coast zone. This requires a systematic planning to improve the farm management and the involvement of Government and non-governmental organizations to set up treatment plants and also assist the small farmers in all aspects of requirements for the enlistment of revenue through the exports.

The Supreme Court in its judgment dated 11 December 1996 regarding setting up of shrimp farms in coastal areas held that aquaculture is an industry and hence covered by the prohibition imposed in the Coastal Regulation Zone.
Notification, 1991. The salient features of the Supreme Court’s judgment are: An Authority to be constituted under Environment (Protection) Act, 1986 to deal with the situation created by shrimp culture in the coastal areas; No shrimp culture pond shall be constructed/ set up within the Coastal Regulation Zone (CRZ), except traditional and improved traditional types of ponds. This shall be applicable to all seas, bays, estuaries, creeks, rivers and backwaters;

No shrimp culture ponds shall be constructed/ set up within 1,000 meters of Chilka lake and Pulicat lake (including bird sanctuaries namely, Yadurapattu and Nelapattu). All shrimp culture ponds operating/ set up in the CRZ as defined under the CRZ Notification, 1991 shall be demolished and removed from the said area. Shrimp culture ponds, other than traditional and improved traditional can be constructed/ set up outside CRZ with prior approval of the Authority; Shrimp farmers who are operating traditional and improved traditional systems of aquaculture may adopt improved technology for increased production, productivity and returns with prior approval of the ‘authority’ constituted by this Order;

The agricultural lands, salt pan lands, mangroves, wet lands, forest lands, land for village common purpose and the land meant for public purposes shall not be used/ converted for construction of shrimp culture ponds; The Authority so constituted by the Central Government shall implement the “Precautionary Principle” and the “Polluter Pays Principle”; and The shrimp culture ponds which have been functioning/ operating within the CRZ as defined by the CRZ Notification and within 1,000 meters from Chilka and Pulicat lakes shall be liable to compensate the affected persons on the basis of the “Polluter Pays Principle”. The Apex Court directed that
while the stay on demolition shall continue there will be no fresh stocking of seeds in the aquaculture farms within 500 m of the high tide line, which were required to be demolished.

The present sample study substantiates severity of the coastal environment; deteriorates the coastal environment by polluting surface and subsurface waters. The digital maps prepared by using IRS P6 data shows the environmental hazardous areas nearby farms and hamlets which would have a long term environmental implications. The primary sample survey has also substantiated that the people in this part of the region are well aware of the situation even before the Supreme Court judgment. The tsunami has further aggravated the coastal environment of this part of the region, already damaging the environment due to the presence of many shrimp aquaculture ponds.

The existing aquaculture farms has polluted surface and sub surface water characteristics and it is clear from the judgment of the supreme jurisdiction of India that no more farms should be set up in this region; at the same time the existing farms should be adhered with the pollution norms specified by the national standards. Though aquaculture farms provide excellent opportunities to the farmers, particularly the small farmers who are depending on their survival, but the deteriorating environmental conditions of the people in these regions were of major concerns. The Nagapattinam coast zone has already been polluted due to the outlet of farm wastewater and many scientific studies proves this fact. The destruction activities of tsunami 2004 has aggravated this problem, due to the intrusion of sea water and the destruction of ponds and this has affected the coastal aquaculture
small farmers and the environmental conditions of this coast zone. This requires a systematic planning to improve the farm management and the involvement of Government and non-governmental organizations to set up treatment plants and also assist the small farmers in all aspects of requirements for the enlistment of revenue through the exports. The following are the major outcome from the research.

Horticultural crops have suffered damage in the districts due to inundation by sea water and sand over an extent of 370 ha. Relief amount for a sum of Rs.31.4 Million Rupees has been provided for compensation of the reclamation and for inputs of new crops. A sum of 100 million rupees has been provided for repairing and reconstructing the damaged plantation areas, stabilizing the sand in the coastal areas and conserving the ecosystem by planting mangroves over an area of 1400 ha. in the coastal zones.

The destructed infrastructures such as roads, Government buildings, Shelters and educational institutions have been restored. For this a sum of 351.6 Million Rupees has been allotted. A sum of 26.28 Million Rupees is provided to restore cyclone shelters to provide protection to coastal area residents from natural calamities such as tsunami and cyclones. A sum of 22.7 Million Rupees was provided for repairs and reconstruction of Government buildings badly damaged due to tsunami. For educational institutions, 184.7 Million Rupees was provided for repairs and restoration. A sum of 341.5 Million Rupees for immediate repair of Highways and other roads has been sanctioned and the Department has so far executed works to the tune of 2,968 Million Rupees. A sum of Rs.10.09 Lakhs for
providing public address system to convey emergency messages to public in Nagapattinam District. This aims at restoring the damaged river banks and the canal system in the District for a sum of 192.7 million rupees have been provided.

For housing reconstruction project, a sum of 184 Million Rupees was provided for Capacity Building, Technical assistance, Layout planning and other technical services and preparation of social and environmental management plan. Technical studies for studying the effects of tsunami in the coastal areas, mapping the inundation risk in the coastal areas, suggesting measures to protect the coastal areas from future inundation by way of walls, groins etc. will also be undertaken for which 30 Million Rupees was provided. A sum of 13.14 Million Rupees has been provided for the study of vulnerability of coastal Nagapattinam especially relating to agriculture.

This project management financing the incremental operating costs associated with the implementation and monitoring costs incurred for the various relief and rehabilitation work in the district. In addition, it would finance incremental and exclusive staff costs, equipment, hiring of vehicles and consulting services for training, quality assurance, monitoring and evaluation, environmental and social assessments and audits, among others. A sum of 201.4 Million Rupees have been provided for this purpose.

Free text books, note books and uniforms have been disbursed to the students of 1st Std to 12th Std who are studying in Government / Govt. aided schools located in Tsunami affected areas. 40000 students were benefited. 13.1 Million Rupees has been spent for this purpose. 29.1 Million Rupees has been
sanctioned for uniforms. The tuition fees and special fees payable by the students of Tsunami affected families for the period from 01.01.2005 to the end of the academic year 2005-06 will be borne by the State Government. The scheme has been extended further for the academic year 2006 - 07. In addition, the students will be exempted from payment of examination fees from March 2005 to the end of academic year 2005-2006 and 2006 - 07. Separate public examinations for the students studying in 121 number of Tsunami affected schools have been conducted. The pass percentage of these students was 79.38 per cent in Higher Secondary and 81.31 per cent in X std exams which are better than the average pass rates of the State.

6.2 Conclusion

The Tsunami affected communities though their losses were not as visible at present, there exist a equal traumatic and crippling for these communities as the allocation of permanent shelters were not yet completed to the affected habitations. When we say how for the Tsunami relief and rehabilitation work is successful, it is appropriate to say, the work is only partially successful as approximately only 40% of people from the affected habitation were allocated permanent shelter, when intervened about it the concerned officials reveals that the construction of permanent shelters is in progress and will be completed within this year and handled over to the affected communities. The problem of allocation of permanent shelters at a distance of less than 500m form the seashore must be considered as one of the major issue in relief and rehabilitation work. The possible suggestion to this issue is to construct groin wall in the area where permanent shelters are allocated in close proximity to
the seashore. Also, some other measures such as encouraging mangrove plantations close to the seashore, adopt sand dune vegetation and spiny vegetation that will keep sand particles intact and reduces the impact of Tsunami and coastal flooding in these area. This provides safeguard the communities and reduces the vulnerability of the community’s allocated permanent shelters in the vulnerable area.

The present study has highlighted the impact of tsunami on the coastal ecosystem and how it has affected the coastal population and further aggravating the environmental conditions in two most affected villages of Akkaraipettai and Keechankuppam. The destruction caused by the December tsunami had taken several lives and given a parallel struggle for the rest of the fishermen community for survival. The analysis performed for the fishing hamlets along the coast zone of Nagapattinam was the worst affected in India, particularly the Akkaraipettai and Keechankuppam which were driven away by the violent tsunami waves. It has also caused a major hazard for the physical landscape by dumping huge sand parcels over the areas of agricultural, aqua cultural ponds and major inland water bodies. Tsunami has taught a lesson to the coastal communities those who are living adjacent to coast as well as in low lying areas, the destruction is unavoidable. The district administration have to first demarcate the coastal regulation zone and from the study the sea water intrusion levels and provide the coastal communities to shift their temporary residences wherein there should be devoid of such type of natural calamity in future.

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The present study has been taken to find how safe practice is possible in a shrimp aquaculture pond area without affecting the physical and cultural environment. For the sample study 42 ponds have been taken for the mapping and analysis and safe practice have been implemented without affecting their natural environment. The study also shows that the proper inlet and outlets using GPS field survey methods. Secondly the growth of shrimp aquaculture during the pre and post tsunami periods due to the salt water intrusion. The study concludes the safe practice methods and the increased growth rate of shrimps in the sample ponds.