COMMUNITY PERCEPTION TOWARDS A SET BACK AREA : A CASE STUDY IN GALLE DISTRICT, SRI LANKA

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ABSTRACT

In view of the coastal areas, vulnerability to natural hazards particularly tsunami, earthquakes, etc, are rather increasing. The tsunami, giant tidal waves struck on 26th of December 2004 caused severe damage to people and their livelihood. It is now felt that the country should enforce a regulation procedure to manage the coastal zone. This addresses the concept of a set back area in order to mitigate the severity of natural disasters. But, the promulgation of set back area should be account for community perception. Hence, this study was aimed to assess the community perception, possible constraints, and to extract criteria to demarcate a set back area in the littoral. The study was carried out in Galle district, in Southern Sri Lanka, which is one of the districts greatly affected by the tsunami. Three divisional secretariat (DS) divisions viz; Habaraduwa, Hikkaduwa and Galle were selected. Simple random sampling was used to select 120 households. Primary data were gleaned using a pre-tested questionnaire. Informal discussions were held with coastal dwellers, government officers, &etc. The data were analyzed and evaluated to assess the objectives. Accordingly, 54 percent of the community is involved in activities based on fisheries and tourism. The rest 46 percent are engaged in other activities, which are non-stationed in the coastal zone. More than 80 percent households of the area are vulnerable for natural disasters. In consequence, 66 percent were fully damaged and 34 percent were partially damaged. Totally 76 percent of the villagers are willing to have a set back area. But, only 48 percent from 100 m boundary, agreed to have a buffer zone and majority (52%) did not want to leave the place. The reason is that their livelihood activities are adhered to the shore. Further, the buffer zone would reduce the land use efficiency since, it requires 0.25 percent land area. Hence, it is advisable to maintain a buffer zone with a green belt, which is most effective to abate the sea waves. The demarcation of a set back area should consider the geomorphology, natural vegetation cover, &etc. Moreover, government incentives, concessionary loans, permits &etc are tools to promote settlements in inland. Since, the community is in uncertainty and unsecured, willing to have more secured land strip as a buffer zone. Ipso facto, a set back area is a community-blessed concept to mitigate dreadful natural destructions and also to assure the sustainability of the area.

Keywords: set back area, no build zone, restricted zone

INTRODUCTION

Coastal zone in Sri Lanka

Sri Lanka, The Pearl of the Indian ocean, is an island lying to the south east of India between latitudes 5^0 55'- 9^0 51' north and longitudes $79^0$41'- 81^0 54' east, between the tropic of cancer and the equator. The island has a land area of 65610 km^2 (25000 $mile^2$). The country has a 1700 km long coastline and 30,000km^2 continental shelf area up to 120 m depth. From the declaration of the Exclusive Economic Zone in 1978, Sri Lanka has sovereign rights over 517,000 km^2 of ocean; which is around 7.8 times than the land area of the country.

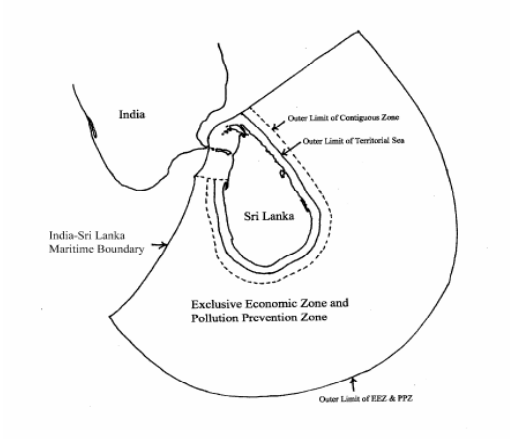

Figure 1. Exclusive Economic Zone – Sri Lanka

In fact, for a small island like Sri Lanka, the coastal zone obviously forms a significant part of the landscape. Development activities covering the fisheries sector and the coastal zone play a vital role in the economy of the country. Therefore, the coastal belt provides unlimited benefits to the coastal dwellers over a wide range.

Figure 2: Coastal Belt in Sri Lanka

For management and conservation purposes of the coastal environment, the coastline is defined as the "Coastal Zone" (Fig. 3), which is described in the coast conservation act of 1981 as "the area lying within a limit of 300m landward of the mean high water level and a limit of 2 km seaward of the mean low water level. In the case of rivers, streams, lagoons or any other body of water connected to the sea either permanently or periodically the landward boundary extends to a limit of 2km measured perpendicular to the straight base line drawn between the natural entrance points. Thereof and includes the waters of such rivers, streams and lagoons or any other body of water so connected to the sea."

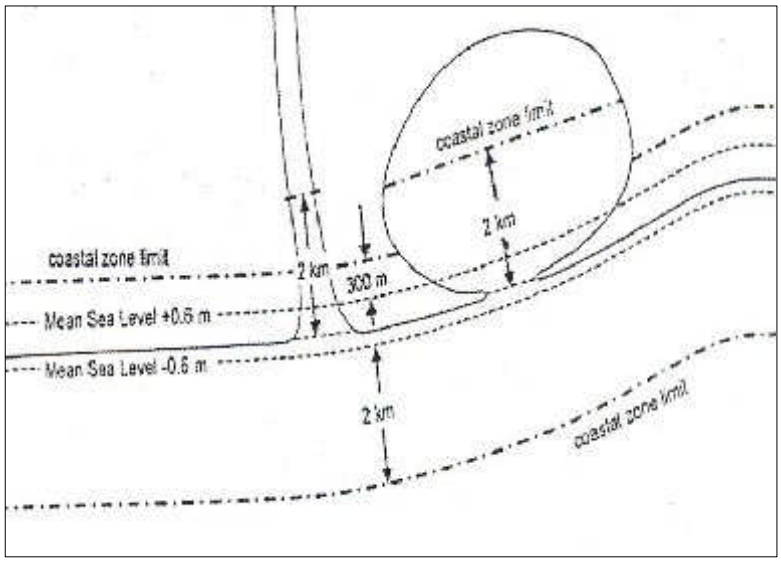

Fig 3 : Boundaries of the Coastal Zone

Sri Lankan coastal line is characterized by a series of picturesque sandy bays, sand dunes, spits, rocky headlands, and sand beaches, lagoons, mangroves and estuaries are the other important coastal habitats that contribute considerably to the coastal livelihood.

Socio economic features

The coastal region comprises of 74 Divisional Secretariat divisions (DSDs) with a coastal boundary which contains about 24 percent of the total land area. The inhabitants of the coastal zone make up roughly 25 percent of the population of the island (4.6 million people out of 18.73 million people in the whole country). Of the total number of tourist hotels, 70 percent (159 hotels) locate in the coastal zone plus 62 percent of industrial units which are contributing to the national GDP (CZMP, 2004).

Sri Lankan coastal and marine areas have considerable socio economic significance since time immemorial and the use of coastal ocean resources are linked to public health, food security and economic benefits including traditional livestock and social benefits and cultural values of the people. The inhabitants of the coastal zone are comparatively in poverty and under poor standard of living.

Fishing activities play an important role in the coastal economy. Estimates show that the coastal fishery accounts for around 64 percent of the marine fishery. This in turn provides 91 percent of the total fish production in Sri Lanka, (CZMP, 2004) which earns foreign exchange over 6 billion rupees (600 USD). The fisheries sector including coastal aquaculture provides direct employment to about 150,000 people and sustenance to at least a million. The coastal region is the hub of industrial production and contains 62 percent of all industrial units. There are over 30 coastal DS divisions with industrial units; most of these units are clustered in Colombo, Gampaha, Kalutara, Galle, Matara and Puttalam districts. Tourism is the fifth largest income

earner in Sri Lanka and had netted in 18,863.3 million LKR (US$ 211 million) in 2001. It also provides direct and indirect employment to over 85,000 people.

High priority sites of archeological, historical, religious, scenic and recreational in the coastal zone enhance the economic value by promoting tourism related activities. Country's economy is also enhanced by the commercial ports, fishing harbors, anchorages, fish landing sites and saltern located in this area. Therefore, it can be said that the coastal zone provides its assistance for socio economic factors.

Tsunami Devastation

The tsunami harbour waves hit Sri Lanka caused a huge havoc to coastal lives and livelihood activities on 26th of December, 2004. The damage in Southern, Northern, and Eastern provinces recorded at a highest severity. The damage to the different sectors in the coastal economies are shown in the following table.

Table 01 : Damage to the livelihood and other sectors

Sector	Damage (Rs billion)	USD (billion)
Livelihood	70	0.7
Education	2,700	27
Housing	4,850	48.5
Power	1,000	10
Water Supply, Sanitation and Transport	4,400	44
Railway	1,500	15
Roads	6,300	63
Total	20,820	208.2

(Source: Nayanananda, 2007)

According to the table 01, the major sectors damaged are road, housing, and infrastructure. The reason behind this loss is the high population density in the coastal zone as mentioned earlier. It caused the huge live losses and made number of refugees. The statistics shows that, 27,000 fishermen and fishing families were died. More over, 90,000 were displaced due to loss of housing and their households (MFAR, 2005). The damage of the fisheries sector in three districts of Southern province has shown in the table 02.

Table 02 : Damage to the fisheries sector in Southern province

Damaged or fully destroyed	Galle	Matara	Hambantota	Total
No of households	7157	7147	6086	74596
Fishermen	4989	6461	4618	66801
Damaged boats	561	1165	696	7105
Destroyed boats	841	763	1134	16101

(Fisheries sector damage assessment survey, MFAR,2005)

In general, 32,000 fishing fleets (about ¾ of total number from the whole country) were damaged or fully destroyed. Apart from that, 10 fishery harbours, 37 anchorages, 200 landing sites, fishery cooperation buildings, ice plants, cold stores, and boat repair yards were damaged.

The coastal habitats were extensively damaged due to the tsunami. The shore line was severely affected, eroded and covered with debris. Sea water intrusion destroyed cultivatable lands, paddy fields and natural vegetation in the area (Nayanananda, 2007). According to the FAO assessment, the damage due to tsunami in the Special Area Management (SAM) sites and coastal environment was around US $ 32 million.

The coastal GDP to the national GDP is around 44 percent. Due to the tsunami devastation, the national GDP loss in 2005 is estimated as 1676.7 million Sri Lankan rupees reflecting 25. 2 percent decline (Central Bank, 2006).

BACKGROUND AND OBJECTIVE

Coastal zone is a key economically important land strip for any country nearby the sea. It adds a scenic beauty to enhance tourism, substrate for the fishing community to empower the fishery industry and a landscape with higher bio diversity. More over, the coastal areas vulnerability to certain natural hazards particularly tsunami, earthquakes, wind storms land slides, …etc, are rather increasing. Hence, any country might be obliged to take anticipatory measures, planning, and expenditure measures, in order to minimize danger and damage. The tsunami, giant waves struck on 26th December 2004 caused severe damage to people as well as their livelihood systems along the coastal region in Sri Lanka. Recent experience has shown, if disaster-preparedness programs and emergency response measures were available, could reduce the loss of life and economic costs resulting from such events. Hence, it is vital to formulate a coastal zone management strategy in order to maintain this precious resource for its sustainability as well as to strengthen the economy. It is also emphasized that a tsunami vulnerable zone should be defined and all permanent constructions should be moved inland beyond this zone. This addresses the concept of a set back area in order to mitigate the severity of natural disasters (Koralagama, 2006). A setback area is an inexcusable component, which comes under the coastal zone management. In fact, it is worthwhile to get community scope towards the establishment of a set back area in order to maintain the coastal zone and use to avoid natural disasters like tsunami. Therefore, this study mainly formulated to extract the possible criteria to demarcate the set back area to minimize the losses from hazards and to evaluate the community perception over a set back area.

SET BACK AREA

A Setback Area is a geographical strip or band within the coastal zone within which certain development activities are prohibited or significantly restricted. The entire set back band is divided into segments *viz*. the reservation area and the restricted area lying between the Seaward Reference Line and the Landward Reference Line of the particular coastal segment (www.coastal.gov.lk).

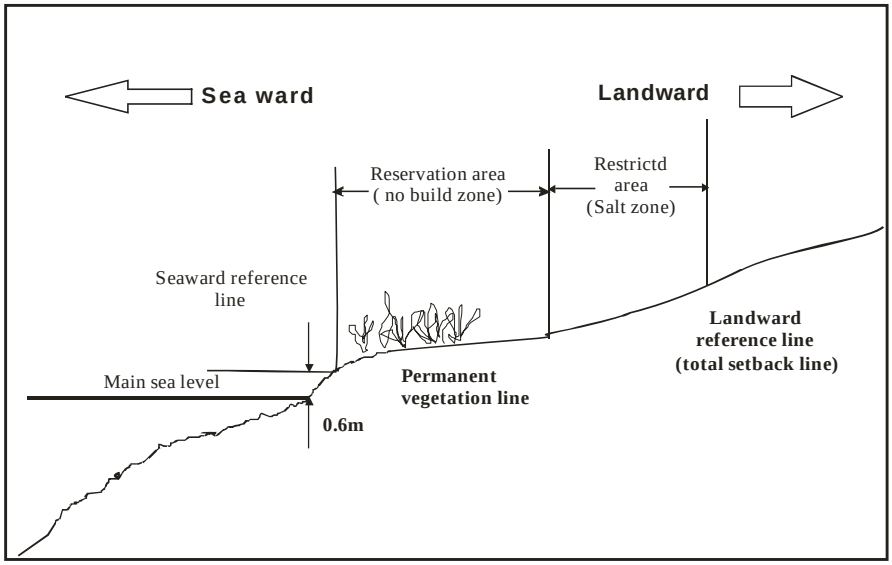

Figure 3 : Set Back area

The Seaward Reference Line is generally the plus 0.6-meter line from the mean sea level (MSL). However, the Coast Conservation Department (CCD) reserves the right to demarcate setbacks from the permanent vegetation line on the beach front where coconut (*Cocos nucifera), maharawana ravula (Spinifex littoreus), wetakeiya (Pandanus spp), or mudilla (Barringtonia speciosa*) are present, or in the absence of a permanent vegetation line, the Mean High Water Line (MHWL), an appropriate contour line above MSL, the landward edge of the dunes or the seaward edge of the top of the cliff will be considered to be the Seaward Reference Line (CCD, 2006). The Landward Reference Line will generally be the landward boundary line of the setback area, if not stated otherwise.

Reservation and Restricted Area of Setback

Reservation Area is nearest to the shoreline and corresponds to a "no build zone" in which only uses/ activities, which are absolutely essential are allowed (fig. 3)**,** and a restricted area (or soft zone) can be used for a few low impact activities such as small dwelling units. The width of the Reservation Area and the Restricted Area will vary according to the vulnerability of the particular coastal segment to erosion.

Designation of setback areas is a soft solution intended to achieve coastal stability based primarily on a pro-active approach. Setbacks are utilized as a means of accomplishing a number of objectives. These include: protecting life and property from adverse impacts of coastal erosion and storm surges, minimizing public investment in coastal conservation activities, protecting and enhancing the scenic value of the coastal environment, protecting vulnerable coastal habitats and unique natural sites, providing buffer zones around archaeological, historical and cultural sites within the coastal zone, minimizing user conflicts arising from different activities that take place in the coastal zone, ensuring public access to and along the coast (vertical and lateral access), maintaining consistency among national and regional laws and plans, and ensuring consistency between national development goals and environmental objectives (Samaranayake, 2000).

In fact, a formation of a set back area is an excellent idea to lessen the severity of the unforeseen hazards and also to protect the precious eco systems in a sustainable way. Community participation and their ideas are required to a greater extent in order to implement such a strategy in an efficient and effective way.

METHODOLOGY

Southern and Eastern provinces of Sri Lanka were severely damaged due to the tsunami catastrophe. In fact, the study aimed the Southern coastal belt rather than Eastern, concerning the time limitation and accessibility to the area. The estimation of the government revealed that the damage is high in Galle district among the three districts (Galle, Matara, and Hambantota)of Southern province. It lead to position the survey in Galle. In Galle, the main Divisional Secretariat Divisions (DSDs) exposed to sea are; Habaraduwa, Hikkaduwa, and Galle. Further, those DSDs are within the 200 m from the sea, and within the so called set back area. Targeted group was the coastal dwellers within the boundary of 200 m. Hence, 120 house holds were selected equally from three DSDs. Simple random sampling was carried out due to the convenience and time limitation. The sampling was done according to the sampling frame of tsunami affected households obtained from Divisional secretariat. Primary data were gleaned using a pre – tested questionnaire. More over, informal discussions were carried out in other areas (apart from the cluster) headed by community leaders. Secondary data were collected through government institutes such as, Coast Conservation Department, Urban Development Authority, and related web sites…*etc*. The gathered data were analyzed to evaluate the objectives in order to draw an elaborative picture about the study.

Figure 4: The map of the survey area

RESULTS AND DISCUSSION

The results reveal that the 54 percent of the sample are working within the coastal zone and rest are out of the boundary. Of that, 38 percent are involving in activities related to the coastal zone, such as fisheries, diving, tourism, selling textiles, souvenirs, jewelry… etc. But, majority 68 percent are not depend on the coastal zone based livelihood activities (fig. 5).

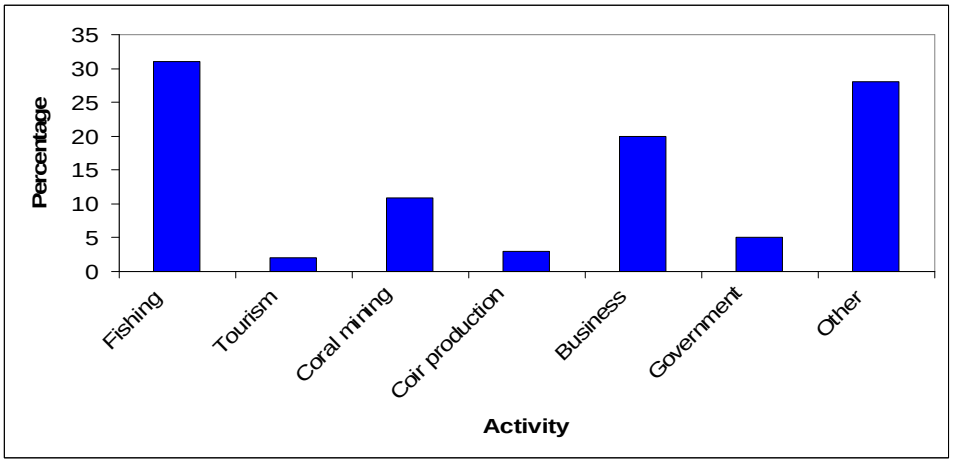

Figure. 05. Livelihood activities within the coastal zone

According to the figure 05 , it is noticeable that the coastal zone is populated with people who are not only engaged in coast based livelihood activities but also in other business ventures, self employments as well. This is mainly because of the prevailing high level of infrastructure facilities.

According to the surveyed data, 48 percent of dwellers within the 100 m boundary agreed to have a 100 m buffer zone, where 52 percent were reluctant to move from their inherent places. This is mainly because of the existing place is favour of their livelihood activities, business, inherent lands, easy access to all the infrastructure facilities…etc. Further, 76 percent of the total sample were supported to this idea. The main reason for the willingness to leave the area is, insecurity. The people who live in the area are in an uncertainty of another tsunami occurrence. In fact, according to the chi square test, there is no any significant relationships between willingness to leave and age, education, occupation, and land ownership (Rasika, 2006).

Almost all the sample members agreed to have a set back area along the coastal zone. More over, 94 percent of the sample agreed to keep a no build zone together with a restricted zone considering three main criteria as; to prevent pollution by industries, to maintain coastal vegetation, and to preserve natural habitats. Another important decision came out from the study was, keep 100 m set back area as 50 m beach strip of no build area plus 50 m restricted zone (fig. 06).

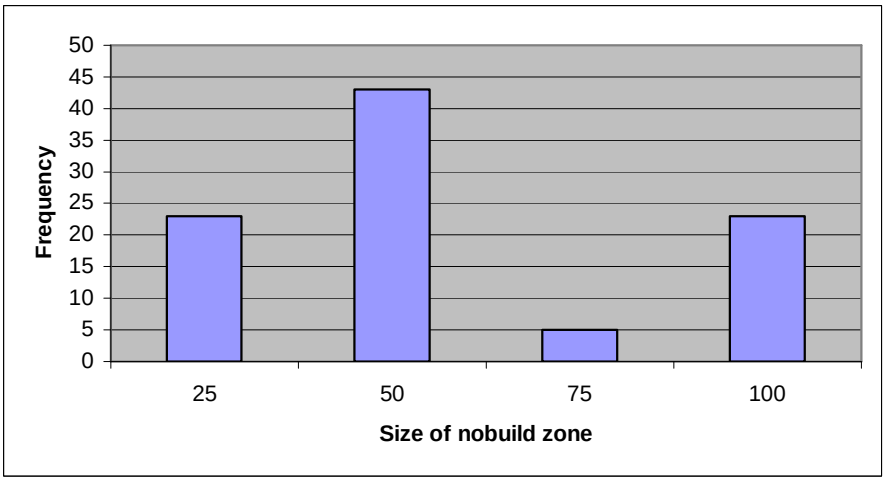

Figure 06: Community perception for a No build Zone

The community perception towards the criteria to determine the set back goes to geomorphology and exposure to extreme natural hazards. Fishing and tourism are the demanding activities within the set back area. About 30 percent of the sample agreed for fishing and 23 percent for tourism, where only 15 percent wanted to use the land strip for cultivation (Rasika, 2006).

The extent of area reserves as set back is significant (0.25%) to an island like Sri Lanka. In fact, it is worth while to use this strip in an effective way. The community's suggestion was to preserve the area as a green belt with 49 percent of sample votes.

According to this study, it is obvious that the area should be preserved as a set back is important and accepted by the community as well. But, a blanket recommendation of either 50m, 100m, or 150m is not wise. In fact, it is advisable to evaluate certain other parameters in order to assign an effective set back area along the coastal line. The Sri Lankan Coast Conservation Department has been put forward the basic criteria which they had been used for East and North – east coast of Sri Lanka. Coastal erosion rate, level of user conflicts, legal status, land titles, vulnerability of coastal habitats, level of development (urbanization, infrastructure facilities, business units), significance of cultural and archeological sites (ancient religious places, cultural centers), special area management sites (*Rekawa* lagoon), geographical characteristics (mean sea water level, elevation, permanent vegetation line, sand bars), and exposure to extreme natural attributes (cyclones, storm) are paramount (CCD, 2006).

On the other hand, government together with urban Development Authority (UDA), encourage people to leave the coastal zone and settle in inland areas. All the families within 100 m and 200 m coastal zone, those who are willing to construct their own houses outside will be paid, 2500 USD financial assistance and if necessary concessionary loans by the state banks. Further, government maintaining a permit systems, tax, levies, licensing to mitigate the activities within the coastal zone. Also, it provides, grants, incentives, promotion schemes for the activities outside the coastal zone. This would motivate people to be resettle in the landward.

CONCLUSION

Mainly because of the insecurity in coastal area, people willing to have a set back area of 100 m. But, it also undergoes on certain variances like, geomorphology, natural vegetation cover, sand dunes, coral reefs, and other wave breakers. On the other hand, the buffer zone or the set back area would reduce the land use efficiency, since it requires 0.25 percent from total land area of Sri Lanka. With the high growing population, this would be a major issue. Hence, it is advisable to maintain a buffer zone with a green belt, which is most effective to abate the sea waves as well as proliferate tourism. The demarcation of a set back area should consider the permanent vegetation line, mean high water level, contour line, landward edge of the dunes, geomorphology, …etc. This can be maximized the land use efficiency. Moreover, government incentives, grants, concessionary loans, permits…etc are valuable tools to promote settlements in inland. Since, the community is in uncertainty and unsecured, willing to have more secured land strip as a buffer zone. Ipso facto, a set back area is a community blessed concept to mitigate dreadful natural destructions and it will assure the sustainability of this precious resource for the next generations too.

BIBILIOGRAPHY

Central Bank, (2006)., *Annual Report*, Central Bank, Sri Lanka.

Coastal Zone Management Plan (2001). Dublin, Spatial Planning Unit, Department of the Environment & Local Government.

Coastal Zone Management Plan, (2003, 2004). Coast Conservation Department, Ministry of Fisheries and Aquatic resources, Colombo, Sri lanka.

Koralagama D N and Piyadasa R U K, (2006). *Development of Market Based Instruments for the Medium & Long Term Implementation of the National Program of Action for the protection of the Marine Environment from Land Based Activities – Coastal sector,* Ministry of Environment, Sri Lanka.

Nayananada, O K., (2007). *The study of economic significance of coastal region of Sri lanka in the context of environmental changes of pre and post tsunami*, Coast Conservation department, Sri Lanka.

Rasika, Amarasinghe, O., (2006), *Set Back criteria for coastal zone management*, Unpublished thesis, University of Ruhuna, Sri Lanka.

Samaranayake. R.A.D.B., (2000). Sri Lanka's Agenda for Coastal zone Management, *The review of advanced technologies for the integrated Management of EEZ and coastal zones worldwide*, 5th Edition, ICG publishing limited.

Statistical unit of Ministry of Fisheries and Aquatic Resources, (2004). Colombo 10, Sri Lanka.

Weeragala, N N M S G D., 2005. *Definition of a Tsunami Safe Boundary for Sri Lanka, A case study in the Coastal zone of Galle, Matara and Hambantota Districts*. *Coasts and Coastal People Scenarios of Change and Responses*, Netherlands, June.

http://www.coastal.gov.lk
http://www.nara.lk/

http://www.naqda.gov.lk/pages/stats.asp

http://www.fisheries.gov.lk/

http://www.uda.lk/