

**POST - TSUNAMI STATUS OF SELECTED COASTAL
ECOSYSTEMS AND ITS RELEVANCE TO COASTAL
ENVIRONMENT AND COMMUNITIES IN BATTICALOA
DISTRICT, SRI LANKA**



**A THESIS SUBMITTED FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY
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by

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ABSTRACT

The aim of this study was to examine different coastal vegetation types, factors that may influence the vegetation types and the relationship between them. It also compared the areas which had been affected /inundated by the Tsunami (93 %) and those that were less-affected (7 %) by the tsunami, from 43 coastal sites of the Batticaloa district. It was possible to group the vegetation for convenience from the 43 coastal sites into five types.

Sampling was done along transects perpendicular to sea, for a distance of 150 m, from Mean High Tide mark (MHT). Three parallel transects were chosen at each of the study site. Measurements were made in 50x3 m sub plots in each transect.

Sandy-regasol was the major soil type in the study sites. Surface temperature of soil was higher than the air temperature. Mean soil pH varied from 7.5 to 9.0. A significant difference ($p < 0.05$) in soil pH was noted with soil depths and vegetation types. Soil pH of tsunami-affected coastal vegetation types was close to the tsunami less-affected one. No significant difference ($p > 0.05$) was noted in soil salinity, electrical conductivity (EC) and total dissolved solids (TDS) for soil depths. Soil salinity, EC and TDS decreased from the sea to land, along transects. Higher values for salinity, EC and TDS were noted between 0-27 m from mean high tide mark (MHT) and reduced thereafter. Salinity, EC and TDS showed no significant difference ($p > 0.05$) between tsunami-affected and less-affected study sites.

Vegetation was not found between 0-27m from MHT. The mean distance of permanent vegetation line (PVL) was 50 m from the MHT. Shrubs appeared around 80 m and tress appeared at around 98 m from MHT. Mean distance of PVL in tsunami affected study sites were greater than tsunami less-affected study sites. Vegetation appeared when the soil salinity was close to zero ppt. An increase in ground cover was recorded from 30 m up to 70 m from MHT and remained stable thereafter. Forty seven plant species were recorded from 27 plant families. Major families were Fabaceae, Apocyanacea and Verbanaceae. More number of plant species were recorded in the tsunami-affected study

sites (44 species) than tsunami less-affected study sites (37 species). Mean Species Richness was 25.3 for tsunami affected study sites and 16.3 for tsunami less-affected study sites. It was revealed that the extended distribution of *Ipomoea pes-caprae* to 500-700 m in some places, differing from 200 m limits from tsunami less-affected sites.

Casuarina plantation was a major component of vegetation in Batticaloa district. Twenty six percent (97 ha) of plantation had been established before the tsunami and 74 % (275 ha) after the tsunami. It was found that 26 % (96 ha) of planted *Casuarina* had been lost due to illegal cutting, felling, burning and non survival of plants after planting.

Ninety nine acres of coastal areas had been cleared for tourism development at Kaludah/Pasikudah. Development activities should travel parallel with protection of environment for sustainable existence of development, environment and communities.

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