

Ecological Preservation Through Scientific Management of Coastal Vegetation in Cuddalore District

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ABSTRACT

GPS coordinates were taken during the study at different locations along the coastline of Cuddalore district and were plotted in the Google maps and the vacant area available (i.e. open space available for planting trees) was calculated with the help of softwares and it was found that 387.73 hectares was available as vacant along the Cuddalore coastline. About 41 species belonging to 40 genera and 27 families were registered along the coastline. Fabaceae was the most common and dominant family with 6 species followed by and Apocynaceae (3 species) and 2 species each in Arecaceae, Euphorbiaceae, Myrtaceae and Cyperaceae and nineteen families were represented only by one single species. About 12 species of mangroves were identified in the mangrove vegetation in Pitchavaram. The inoculation of N-fixer (Frankia) resulted increased growth than non-inoculated trees. Under experimental conditions N-fixer results 100% of root nodule formation in the seedlings of *C. equisetifolia* and *C. junghuhiana* by application of @ 5 ml/seedling. Also, Frankia with vermicompost resulted in enhanced plant growth

(57.55 cm) in 4 months over the control (42.10 cm) in field conditions.

Keywords Ecological preservation, Scientific management, Coastal vegetation, Cuddalore district.

INTRODUCTION

India has a coastal line of 8118 km that has to be protected from environmental degradation, natural calamities like cyclone, tidal waves and Tsunamis. The state of Tamil Nadu has a coastline of about 1076 km (1016 km in the East Coast and 60 km in the West Coast) with 13 districts on the coast including Chennai city. These districts are particularly vulnerable to high speed winds especially during the cyclones and North East monsoons affecting the lands there with sea inundation at times (Anthoni and Shivashankar 2012). The coastal zone is one among the 10 biogeographically important habitats of the Indian subcontinent. Natural disasters such as storms, cyclones and Tsunamis cause severe damage to human lives and material assets in coastal areas. The green cover is inadequate to protect the hazards. The coastline therefore needs protection. Coastal planning activities after the Tsunami of 2004 have focused mainly on building massive coastal belts (shelter belts) to act as bioshields (Selvam et al. 2005). Both native (mangroves) and non-native species (Casuarina) are being promoted as leading candidates for bioshields, but casuarina monoculture is more widespread as mangrove habitats are limited.

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MATERIALS AND METHODS

The Cuddalore district has a coastal line of 57.5 km. Cuddalore coastal area is prone to both anthropogenic and natural disaster. Industrialization has occupied nearly 500 acres of coastal land which causes pollution and destruction of sand dune vegetation. So, a survey was carried out along the coastline of Cuddalore district from Devanampattinam to Pitchavaram during September 2015 to March 2017 to collect GPS coordinates and plant specimens. Collected GPS coordinates were plotted in the Google maps and the vacant land area available was identified with the help of experts in the remote sensing and GIS department. A line transect along the entire coast length of about 57 kms upto 50 mts width inside the land was made and the plant specimens along the transect was collected and identified by using published flora (Banerjee et al. 2002) and with scientists from Botanical Survey of India, Coimbatore. Experiments were also carried out in the shelter belts established by the forest department in Cuddalore and the experimental design was Randomized Block Design with five treatments and five replications.

RESULTS AND DISCUSSION

During the floristic survey made along the Cuddalore coastline, about 38 number of species belonging to 37 genera and 25 families were identified at different locations from the shoreline. Fabaceae was the most common and dominant family with 6 species followed by and Apocynaceae (3 species) and 2 species each in Arecaceae, Euphorbiaceae, Myrtaceae and Cyperaceae and nineteen families were represented only by one single species. Similar to this study, about 55 species belonging to 46 genera and 26 families were identified at different distances from the Tirunelveli district shoreline (Ramarajan and Murugesan 2014). Temperate Coastal Sand Dunes comprise mainly the members of Poaceae, while tropics with Asteraceae, Cyperaceae and Fabaceae and Poaceae as several authors have pointed out in various parts of the Tamil Nadu region and world, coastal dune flora (Muthukumar and Samuel 2011, Padmavathy et al. 2010).

An area of about 387.73 hectares of vacant land area was identified with the help of Google maps

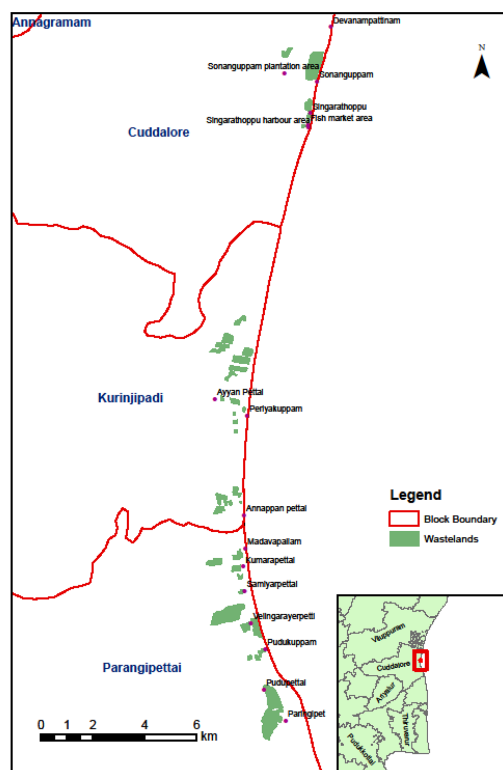


Fig. 1. Area availability map.

which includes farm land, industrial land and government land (Fig. 1).

The inoculation of N-fixer (*Frankia*) resulted increased growth than non-inoculated trees. Under experimental conditions N-fixer results 100% of root nodule formation (Fig. 2) in the seedlings of *C. equisetifolia* and *C. junghuhiana* by application of @ 5 ml / seedling. The growth was enhanced upto 2–3 times than that of the control. Similar findings were obtained from the results reported by Karthikeyan (2016).

CONCLUSION

Palmyra, Cashew, Casuarina, Acacia, Neem and *Pithecellobium* trees along the shores and in the sand dunes may serve as a wall protecting against wind and waves. In the south of Cuddalore, many industries including government industrial estate and private industries cause pollution. Sandy areas are interspersed



Fig. 2

Shelterbelt



Fig. 2. Coastline of Cuddalore district.

with cultivable fields where paddy is grown in rainy periods and groundnut is grown in certain areas from Cuddalore to Paringipet. This belt can be protected by planting *Casuarina* and Cashewnut in sandy areas and mangrove plantation like *Rhizophora* and *Avicennia* in Pitchavaram. Wherever estuaries or backwater exists there is a scope for mangrove plantation, in the river estuaries in Cuddalore and Paringipet.

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