IV. METHODS
METHODS

The eight 1-ha plots, distributed one each in undisturbed and disturbed evergreen, semi-evergreen, deciduous and littoral forests were subdivided into eight hundred 10m x 10m quadrats for the quantitative assessment of trees. All trees \( \geq 30 \text{ cm girth at breast height (gbh, 1.3 m)} \) were measured; for multi-stemmed trees the bole girth was measured separately, basal area calculated and summed. Subsequently the understory plant diversity was investigated in the every 1m x 1m quadrats laid in the top right corner of eight hundred 10m x 10m grids of the total 8-ha study plots. All the understory plants viz. herbs (non-woody small plants \( \sim 1 \) to 1.5 m tall), undershrubs (small plants of 1 to 1.5 m tall with moderate stem thickness), shrubs (\( \sim 1.5 \) to 3m tall with thick stem and branching at ground level without a distinct trunk), herbaceous climbers, gingers, grasses, sedges, aroids and pteridophytes were enumerated. This investigation excluded the seedlings and saplings of tall trees and facultative herbs which are generally epiphytes and occasionally encountered in the forest floors. Voucher specimens of trees and understory plants were collected for each species and identified with local floras (Hooker, 1872-1897; Parkinson, 1923; Hajra et al. 1999). All the specimens were confirmed with the authenticated old collections deposited in the herbarium of Botanical Survey of India, Andaman and Nicobar Circle, Port Blair (PBL) and deposited in Department of Ecology and Environmental Sciences, Pondicherry University.

Data analysis

Species diversity indices such as Shannon (\( H' \)) and Simpson (\( D \)) were calculated. Species-area curves were constructed by sequential summing of scores obtained from
*The field work was carried out from February 2006 to August 2006 in three phases for biodiversity inventory of trees and understory species in undisturbed and disturbed forests. In Phase – I of field work conducted in February 2006, biodiversity inventories in semi-evergreen forests were completed. In Phase – II in April 2006, deciduous and littoral forests were covered and in Phase – III in August 2006, field work in evergreen forests was completed. Photographs of study sites and trees and understory species were taken during February to August 2006.
100m x 10m sub-plots. Relative density, relative dominance, relative frequency and importance value index (IVI), family importance value (FIV) of trees were calculated following Cottam and Curtis (1956). A modified importance value index (IVI) of Curtis and Malntosh (1950), for a score of 200, for each understory species was calculated by summing its relative density and relative frequency. The density of species is the total number of individuals in the 8 ha plot sampled and frequency refers to the number of occurrences in the total quadrats. A modified family importance value (FIV) was calculated by summing the relative diversity [number of species in the family/ total number of species x 100] and relative density of the individuals.

The patterns of tree species composition were examined in the eight sites using non-metric multidimensional scaling (NMS) ordination. The ordination was performed based on the data of species richness and disturbance scores, using PC-ORD package. To examine the species similarity among the ten sites an agglomerative hierarchical clustering analysis was performed, using Sorensen's index (Magurran, 1988).