WORK PLAN AND METHODOLOGY

Keeping in view the objectives of the study, the work will be carried out with the help of secondary data collected by research papers and books.

Study area Mumbai and Thane coastal area is located in Maharashtra state on the west coast of India. It extend between 18.9647° N latitude and 72.8258°E longitude to 19.1828° N latitude and 72.9612° E longitude. Nikam V.S. et al., (2008). Wetland comprise Intertidal mudflats, mangroves, salt marsh, sand beach, rocky beach, tidal creeks, etc. It experiences semi-diurnal tides, with two high and two low tides daily.

Selected area shall be visited every season in the morning, afternoon and evening to analyze meticulously the temperature, humidity and tidal wave fluctuations. Apart from the morphological observation, sampling of seawater to analyze the strength of salinity is also done.

Extensive field survey will undertake in estuary using boats from the nearby estuary villages and walking around estuary to study the mangrove diversity.

With the help of Global Positioning Systems (GPS) all visited site area and Quadrat shall be marked. Photos shall be taken by using the photo Micro Generic Camera for identify the specimens. The mangrove will indentify using the Mangrove of India (Naskar and Mandal, 1999), as well as the help of expert. Ground truthing will be carry out in the field using the Trimble GPS.

Selecting Sampling Strategy:

However, the zonation in mangroves is not so simple and varies from place to place. Every species has its own level of salinity tolerance. Estuaries on west coast show distinct zonation. The high salinity range may be the principal reason for distinct zonation there. The range and force of tidal action also play a determinant role in creation and maintenance of zones as distribution of seeds or propagules is influenced by tidal action. Also, tides do influence the salinity in an estuary.

Taking the above zonation into consideration, we decided to divide any sampling site into three locations –
- High tide zone
- Mid tide zone
- Low tide zone

Every location would be sampled at these three separate points to cover any possible variance in mangrove cover, species distribution and number.

**Transect method:**

- Run a transect perpendicular to the shore from the landward edge to the seaward edge.
- Mark a 10m square plot by using the Trimble GPS at the high, mid and low shore along a transect.
- Within each plot, counts are made for tree counts; and in 1 m x 1 m sub-plot counts are made for seedlings and sapling.
- Counting the numbers of three class of maturity namely, trees, saplings and seedlings by species within the plot.
- Saplings between 1 to 4 m and seedlings below 1 m are counted species wise for numbers.
- Measure height of all the individuals’ species wise.
  
  (Cintron & Novelli, 1984)

**Methodology for estimating total Mangrove cover by GPS:**

The mangrove area shall be estimated by satellite images and ground truthing. The methodology adopted for mangrove area estimation is as follows:

Ground truthing is carried out in field with a GPS instrument. Remote sensed data is matched with actual ground realities. This helps to relate image data to real features and materials on the ground. It calibrates remote-sensed data, and aids in the analysis of what is being sensed.