



CHAPTER 2

BIODIVERSITY ASSESSMENT METHODOLOGY

2.1 INTRODUCTION

The main objective of ecological survey is to collect the baseline terrestrial biodiversity status regarding flora and fauna in the Project Influence Area, (7 Km surrounding the project site), project immediate influence area (500 m surrounding project area and project impacted area (total 49.8 ha). For Terrestrial ecosystem data has been collected through extensive survey of the areas with reference to flora and fauna. Information is also collected from different Government Organizations such as Forest Department, Social Forestry, Dept of Science, Technology & Environment, District Statistical office, Animal Husbandry Dept., Govt. of Himachal Pradesh. On the basis of onsite observations as well as forest department records a checklist of flora and fauna was prepared.

2.2 TERRESTRIAL ECOSYSTEM

The terrestrial eco-system of the study area is dominated by forest on hills, foothills and river valley. The details of assessment techniques used are discussed below.

2.3 FLORA ASSESSMENT

To characterize the vegetation under the project area study was carried out by using Standard Quadrat Method and Random Sampling approach was followed. The project area is open scrub land with dominant shrub species hence quadrat size of 5 x 5m was used for study of trees and shrubs, whereas for grasses and herbs 1x 1m quadrats were used. Immediate impact sites have been considered for study. The number of quadrats was taken such so as to cover 8-10 % of the total land parcel under the project area. The properties of vegetation with reference to species composition and functional attributes are expressed on species basis. The specific formats are formulated to collect information regarding flora & fauna of the project / study area (**Annexure -I**). The details of forest studies are discussed in details below

2.3.1 Assessment Techniques

The density measurements reflect as to how many individuals were present, the dominance measurements denote which species is largest in terms of its presence and the frequency measurements indicate how widely species is distributed among the same plots Importance value is a reasonable measure to assess the overall significance of a species since it takes into account several properties of the species in the vegetation. Importance value index will be



calculated as per Curtes & Mc Intosh (1950). The following parameters will be assessed from the field data measurements.

(1) Importance Value Index

$$\begin{aligned} & \text{Number of species A} \\ \text{(i) Density} &= \frac{\text{Number of species A}}{\text{Area sampled}} \\ \text{(ii) Frequency} &= \frac{\text{Number of plots in which species A occurs}}{\text{Total no. of plots sampled}} \\ \text{(iii) Dominance} &= \frac{\text{Total cover or basal area of species A}}{\text{Area sampled}} \\ \text{(iv) Relative density} &= \frac{\text{Density of species A}}{\text{Total density of all species}} \times 100 \\ \text{(v) Relative frequency} &= \frac{\text{Frequency value for species A}}{\text{Total of all frequency values for all Species}} \times 100 \\ \text{(vi) Relative dominance} &= \frac{\text{Dominance for species A}}{\text{Total Dominance of all species}} \times 100 \end{aligned}$$

(vii) Importance value Index = (relative density + relative dominance+ relative frequency)

(2) Shanon – Weaver Index (1948)

The number of species and number of individuals in a community is measure of species diversity which depends on stability of the habitat. Vegetation of the study area was assess by determining Shannon – Weaver diversity index (1948)

$$D = -\sum (ni / n) \log_2 (ni / n)$$

ni = Number of individuals of each species in the sample

n = Total number of individuals



2.4 FAUNA ASSESSMENT

The fauna assessment technique followed during study varied with type of animal present. The domestic animals were listed based on direct observation during field survey; census data was also collected from the District Statistical office, Shimla. The list of wild life was obtained from Rampur and Anni Forest Division, Govt. of Himachal Pradesh office as well as onsite observations (direct/ indirect method). On the basis of onsite observations as well as forest department records a checklist of fauna was prepared. Birds were identified with the help of a binocular.

2.5 PUBLIC CONSULTATION

The public consultation was conducted during survey of the project/ study area to know about various aspects of forest studies. Information about uses of various plant species by local people as well as sighting of any wildlife species, uses, poaching ect. were obtained .