CHAPTER II

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Trees have profound effect both upon the soils in which they grow and upon the local climate. The growth and survival of forests, therefore, is effected by soil, climate and other environmental factors. While examining major vegetation association of the world it can be observed that climate, topography, drainage, parent material and other factors that influence vegetation development have an equally profound influence on soil development and taxonomy. Hence the soils possessing certain characteristic features are generally found in conjunction with certain ecosystem.

In the Darjeeling Himalayas at different altitudes various types of vegetation have been found due to the diversity of relief, aspect and climatic conditions. Moreover, in this area plantation of different exotic conifers and broad leaved species were raised at different altitudes on trial basis from the long past. This diversity of plant community has differential effect on soil because of the inherent characteristics of a particular plant species on nutrient uptake, its accumulation in the biomass, and return through litterfall.

In the present investigation, an attempt has been made to study vegetation, soil and their intermediate most important component of recycling agent - biological activity, of the middle hill, upper hill, and subalpine regions at an altitude limit of
1700 m to 2650 m of the Darjeeling Himalayan region. Attempts have also been made to study the morphological, physical, chemical and biological properties of soils under different vegetations at different altitudes. The pedogenic evolution of the soils in the region has also been studied. The details of work done have been given below.

- Study on the distribution of vegetation at different altitudes.
- Characterisation of middle hill, upper hill and subalpine forest soils by field morphology, physical, physico-chemical and chemical properties and also nutrient status.
- Soil characteristics under introduced *Pinus patula*, an exotic conifer widely planted in the area.
- Nutrient cycling under different forest cover
- Biological properties under different forest cover in relation to soil characteristics.
- Characterisation of organic matter constituents under different plant communities and their impact on the pedogenesis of soils.
- Mineralogical studies of some selected soils.