GENERAL INTRODUCTION

Biodiversity refers to the variety and variability of all animals, plants and microorganisms on earth. The rapid loss of biodiversity in developing countries has become the subject of increasing national and international concern. This is evidenced in the substantial increase in the interest accorded to biodiversity by governments, aid donors, and conservation organizations. Human activities are progressively reducing the planet's life supporting capacity. The ever-rising human population places heavy demands on the bioresources. The impact and pressure on the environment are quite conspicuous and the onus is seen on the forest resources with depletion of biological diversity, which has become a severe ecological problem (Ehrenfeld, 1972; Lovejoy, 1986; Soulé, 1986, 1991).

The main threat to tropical forest biodiversity is habitat loss, particularly loss of forest cover (Hamilton, 1984; Whitmore and Sayer, 1992). Habitat destruction and degradation are to be considered as the most widespread anthropogenic causes of biodiversity loss (Brown, 1985; Wilson, 1988) and the consequent fragmentation may further differentially increase the vulnerability of species to extinction (Lovejoy, 1986; Vermeij, 1986). Even in protected areas, encroachment is widespread (Howard, 1991), adding to unregulated exploitation

One of the foremost challenges faced by conservation biologists is in assessing and completing the inventory of the world's biodiversity and its various remnant components before they are lost forever. The assessment and inventory are needed to know the current status, abundance and patterns of distribution, in order to evolve appropriate management direction for conserving genetic resources, species populations, biological communities, and ecological systems. The core of any *in situ* conservation effort is actually the long-term program of inventory and monitoring (Szaro 1996). A wide variety of biological, ecological and cultural informations are required to make such an assessment. Different methods have been employed to assess biodiversity such as floristics and structural classification (Barkman, 1990), checklists (Sarkar, 1985; Sam Droege *et al.*, 1998), analysis of forest ecosystem dynamics (Harshorn, 1990), tree structure and regeneration (Sundriyal and Bisht, 1988), which involve heavy financial commitment, time and deployment of trained and committed personnel.

In the last twenty years many new technologies have been introduced and applied in forest resources assessment and monitoring. Computers, databases and programs have shown an exponential growth and are steadily becoming more powerful and cost-affordable. Space borne remote sensing is now widely used in many large inventories and imagery data processing has made extremely rapid progress. They provide a systematic, synoptic view of earth surface at regular time intervals and have been indicated as useful for this purpose (Lubchenco *et al.*, 1991; Stoms and Estes, 1993; Stephan and Davis, 1994; Nagendra, 2001). They have generated information about forest cover, vegetation type, land use changes (Houhgton and Woodwell, 1981; Botkin *et al.*, 1984; Malingreau, 1991; Roy, 1993), and assessment of habitat changes (Chatelain *et al.*, 1996). Remotely derived land mapping is often seen as the only practical basis for regional conservation planning (Franklin, 1993; Noss, 1996; Nix *et al.*, 2000; Pressey *et al.*, 2000). As a result, other benefits have accrued which are mapping and monitoring patterns of biodiversity across large spatial scales, retrieval of information on landscape characteristics that influence biodiversity, structural and functional properties of ecosystems, spatial distribution of different components of biodiversity, patterns of natural and human-induced vegetation changes and impact of various disturbances and ecological interactions. Remotely sensed data can be integrated with information on the physical human environment for analysis and modelling purposes. When combined with field surveys, the potential contribution of remote sensing to studies on biodiversity is literally infinite (Kadmon, 2001). By means of Global positioning system (GPS), the location of sample areas and relevant terrain features have become more accurate and easily recorded.

Davis *et al.*, (1990) proposed an approach to integrate existing data on species distribution and habitat characteristics in biodiversity assessments (mapping biodiversity) using Geographical Information System (GIS) Technology, supported by remote sensing data. Mapping is a promising prerequisite for setting priorities in conservation and monitoring biodiversity and its components at local, national and regional levels and it requires intense ground truthing for verification and integration of various techniques (Pushpangadan and Nair,2001).

The present investigation has undertaken the status of vegetation and distribution of forest types adopting methodologies and technologies indicated above as applicable to the Shervarayan hills.

A detailed account of the investigation is presented in the framework outlined below:

- **Chapter I**

  Vegetation type: *Identification of vegetation types in the Shervarayan hills using IRS 1C LISS III data.*

- **Chapter II**

  Assessment of woody vegetation: To *find out the woody Species diversity in different vegetation type.*

- **Chapter III**

  Relationship of some abiotic factors with vegetation:
  To identify the relationship of vegetation types with some abiotic factors like Rainfall, Elevation, Slope, Hydrogeomorphology.

- **Chapter IV**

  Forest Cover changes: To identify the forest cover changes within the period of twenty years and influence of Biotic pressures on the forest cover changes.

- **Chapter V**

  Evaluation of an Endangered Ecosystem: Detailed evaluation of an Endangered ecosystem (Mining area) and proposed Conservation / Restoration measures

- **Chapter VI**

  Conservation: To identify conservation priority areas and propose Developmental planning for conservation of plant diversity.