CHAPTER 2
LITERATURE SURVEY

Literature Survey

In both terrestrial and aquatic habitats environment consists of biotic and abiotic components functioning together as a system, maintaining harmony between the two. Materials required for the maintenance of body and sustenance of life of organisms are obtained from the abiotic components of the environment. They are then returned to the nature's abiotic pool through the death and decay of organisms. The constant influx and return of the materials in this manner maintains the balance of the abiotic components in the nature. This process of circulation of various elements between the biotic and abiotic components of environment has been going on from time ever-since the first living organism appeared on this planet. In many habitat when the element pool of the abiotic and biotic components is in a dynamic equilibrium, the environment is considered to be ideal. If this balance is disturbed, the system becomes unstable and organic set-up exhibits a change either in quality or in quantity. The biotic and abiotic components of the environment interact with each other and hence are in a dynamic flux. Thus, the abiotic component of the natural pool plays a crucial role in determining the quality and quantity of the organic set-up (Patel, 2002).

Because of the complex interaction of plant and habitat, the composition of vegetation as a unit is more meaningful than listing the component species. Regional climax interacts with regional biota and substrates to produce large, easily recognizable community units called biomass. The biome is the largest land community unit, which is convenient to recognize (Salvi, 2006).

Floristic composition of the forests or any other ecosystems are thus mainly dependent on climatic, edaphic, topographic factors etc. The above mentioned factors will determine the taxonomic diversity and the phytosociological aspects of the vegetation.

A review of literature reveals quite a large number of floristic surveys in Gujarat have been conducted from time to time. Most of the surveys are studied as enlistment of flora and specieswise description, key for classification, assigning a species taxonomic or systematic position, a few studies have also included some ecological aspects, an attempt is made to review some of the these surveys.

Gujarat's diversity of natural habitat ranges from deserts, semi-deserts, mangroves, coral reef coasts and forests. The forest types ranges from dry-deciduous, moist-deciduous to thorn forests and grasslands. Floristic studies in Gujarat had received tremendous attention before and after the bifurcation of Gujarat from the erstwhile Bombay State in 1960. It was explored in its length and breadth by many workers. The floristic and vegetational studies in Gujarat gained momentum in the early part of

this century. Previously, worker have made significant contributions in the field of flora and vegetation of some selected localities in Gujarat like flora of Kachchh (Blatter, 1909), Flora of Barda Hills, Kathiawad (Thaker, 1910), Flora of Dangs (Santapau, 1955). Flora of Saurashtra Vol I (Santapau, 1962) Flora of Pavagadh Hills (Chavan and Oza, 1966), Flora of Gujarat State (Shah, 1978), Forest flora of Gujarat (Patel, 1984), Flora of Saurashtra Vol. II and III (Bole and Pathak, 1988). Flora of Devgadh Hills (Chavan, 1961) Plants of Northern Gujarat (Saxton and Sedgwiek, 1918), Plant systematic (Sutaria, 1958), Flora of Ahmedabad (Gandhi, 1958), Revision of the flora of Bombay Presidency (Blatter and McCann, 1926-1935). This also includes a Sketch of the flora of Gujarat (Shah and Menon, 1979), Flora of Gora range of Rajpipla (Bhatt, 1971), Flora of Khedbrahma Region (Bhatt, 1969), The vegetation of Dwarka on the West Coast (Borgesen, 1929) and The Vegetation of Dangs districts (Jain, 1969).

In Kachchh region, Rao (1981) worked on South-Eastern Kachchh and noted 12 new records from this region. Roavle (1993) worked on endemic desert taxa with a note on the chromosome number - karyotype of some taxa and reported 20 rare plants in this area. Bhatt (1993) worked on the flora of western Kachchh and identified 14 new records from this area.

In North-Gujarat, Yogi (1970) in his Ph.D. thesis has given an account of flora of North Gujarat (Mahudi in Mehsana district) and noted total 132 species of Poaceae, 61 species of ethnobotanical interest and 13 rare plants. Bhatt (1971) worked on flora and vegetation of Khedbrahma region in North Gujarat with a note on the chromosome number.

Punjani (1997) noted ethnobotanical studies on tribal areas of district Sabarkantha. Tatu (1994) has worked on floristic and ecological study of Nal Sarovar using remote-sensing technique.

In central Gujarat, Oza (1962) worked on flora of Pavagadh. Sabnis (1966) has worked on flora of Baroda and its environs including an account of the cyperaceae of Gujarat and noted total 69 species of cyperaceae. Bedi (1968) in his publication on flora of Ratan Mahal and surrounding and recorded total 640 plant species. Deshpande (1968) worked on flora of Tuwa, Panchmahal districts and recorded total 29 rare species. Padate (1973) studied flora and vegetation of Savli taluka. Patil (1980) worked on urban vegetation of Baroda and reported total 57 plants to be apparently extinct with 16 new records. Pandya (1995) studied bioresource common property management in Jambughoda Wildlife Sanctuary. Anjaria (2002) worked on flora of Anand district with special reference to tree species.

Many researchers have worked on the ethnobotanical aspects of Central Gujarat, like Thaker (1974) in his thesis described on account of floristic and ethnobotanical studies on Kawant range forest, and noted total 38 species of ethnobotanical interest. Desai (2002) have studied floristic diversity and ethnobotany of Chhota-udepur forest division.

Karatela (1973) in his study on floristics and phytosociology of Chhota-udepur forest division, reported total 103 species of Leguminosae and 123 rare plants. Bhatt (1975) in his Ph.D. thesis has given an account of the floristic and phytosociology of Panchmahal district and analysed various communities and identied total 81 new plant species. George (1980) in his publication an ecology of Panchmahals analysed various community characteristics such as frequency, abundance, density, relative frequency, abundance and relative density.

On floristics, ecology and ethnobotanical aspects of South Gujarat, considerable works have been done by various workers like Suryanarayana (1969) in his thesis on flora of Dangs forests, noted total 655 plant species, 30 rare plants and 10 plants of ethnobotanical interest. Patel (1971) studied flora of Bulsar and its environs and reported total 705 plant species with 191 plant species as cultivated. More (1972) worked on flora of Parnera hills, Pardi and Udwada areas and noted total 44 rare plants in the area. Desai (1976) conducted studies on the flora of Bansda forests and enumerated total 702 plant species with 114 plant species of leguminosae as new records from this area. Joshi (1980) worked on flora of Surat and its environs, and found 9 new plant records from this area. Vora (1980) in his thesis on Dharampur identified 151 plant species of ethnobotanical interest and 11 plant species as addition to the flora of South Gujarat. Mac (1982) while studying the Flora of Surat, concluded that total 35 plant species are medicinally important and 5 plants are additions to the flora of Surat. Contractor (1986) in his thesis on floristic, phytosociology and ethnobotany studies of Vapi and Umergaon forest, noted total 122 plant species of Leguminosae and 83 plant species as ethnobotanical interest. Pradeepkumar (1998) has worked on Shoolpaneshwar Wildlife Sanctuary.

Reddy (1987) studied flora of Dharampur and noted that total 281 plant species are of ethnobotonical interest and 12 plant species are new additions to the flora of Dharampur. Bhatt (1987) conducted studies on the flora of Navsari area, and enumerated total 813 plant species, with 189 plants ethnobotanical interest and 31 plants as addition to the flora of Navsari. Agarwal (1988) studied the Gora range of Rajpipla by remote-sensing technique. Joshi (1983) studied floristic and phytosociological survey of South-Gujarat Forest with special reference to medicinal plants. Vashi (1985) in his thesis on florisic, phytosociology and ethnobotany of

Umarpada forest enumerated total 183 plant species of leguminosae. Vyas (1974) has worked on floristic and phytosociology of river Narmada. Yadav (1979) worked on the Floristic and Phytosociological studies of some parts of South-Gujarat. Prasad (1989) have done ecological studies in deciduous forest eco-system of South-Gujarat. Rao (1989) studied on Ecological aspects of Dangs Forest.

Other worth-citing contributions are of Parabia (1974) with emphasis on cyperaceae of Gujarat with total 59 plant species as addition to the flora of Gujarat. Parabia (1977) have worked on pollon flora of Gujarat. Gopal (1983) published the ethnobotanical studies and enumerated total 722 plant species of ethnobotanical interest. Umadevi (1988) have worked on medicinal plants of Gujarat and noted 745 plants are medicinal importance. Asari (2000) studied the biodiversity of Gujarat Forest.

Other published work on floristic and ecological studies include - Pandey (2001) for addition to the Flora of Gujarat. Pande and Padhye (1997) have also worked on addition to the Flora of Gujarat. Joshi (1987) studied rare and endangered plants of Gujarat State. Rao and Sabnis (1983) reported flora of Kutch and phytochemistry. Sabnis and Rao (1983) have also published some rare and threatened plants of India. Bedi (1968) noted addition to the flora of Pavagadh. Bedi and Sabnis (1983) have worked on ethnobotany of Dadra-Nagar Haveli and Daman. Bedi and Sabnis (1970) have also noted addition to the flora of Saurashtra. Desai (1992) reported new records for Gujarat flora. Murthy (1957) have worked on biological spectrum of Bhavnagar. Pandya (1972) studied flowering plants of Gujarat University Campus. Patil and Sabnis (1982) found new plants from Baroda. Vidya and Vora (1964) recorded new forms from Ahmedabad. Vora and George (1987) studied various life-forms in Panchmahal forest. Sisodia et al (2003) worked on phytosociology of tree species in Gir National Park and Sanctuary. Desai (2003) studied Biodiversity of Gujarat with special reference to protected areas. Jasrai et al (2003) have worked on plant diversity of Vansda National Park. Shah and Menon (1980) studied flora of Saurashtra and biological spectrum of Saurashtra. Rao and Korlahali (1966) have worked studies on plants form Saurashtra coast. Rao and Safui (1963) noted distribution of some more plants along the Saurashtra coast.

GEER Foundation, has conducted various bio-diversity studies for Hingolgadh Sanctuary, Vansda National Park, Ratan Mahal Wildlife Sanctuary, Rampara Sanctuary, Narayan Sarovar, Wild. ASS Sanctuary, Medicinal Plants of Gujarat and Mangroves in Gujarat. These studies have described flora and faunal biodiversity and ecological studies with diversity index.

GES has also worked on Biological Diversity of Gujarat (1996) including Rare and Endangered Flora and Fauna of Gujarat (2002).

Flora of Saurashtra:

Various reports on Flora of Saurashtra have appeared from time to time. These include publications of Kapadia (1947, 1961) for studies on Porbandar grasses and plant wealth of Gir-Girnar in Junagadh district. Santapau (1953) worked extensively and enunmerated total 980 plant species from Saurashtra region. Later on, Santapau and Janardhan (1967) prepared a checklist of plants occurring in Saurashtra and listed 1136 species under 591 genera, 126 families. Bole and Pathak (1988) in the flora of Saurashtra completed Santapau is unfinished work. They have documented the occurrence of 750 plant species belonging to 335 genera covering Asteraceae to Poaceae families. Raizada and Santapau (1955) contributed to the flora of Gir Forest. Thaker (1987) have worked on flora of Rajkot. Oza (1991) studied the flora. Bhavnagar Chavan (1993) worked on flora and fauna of Gir Forest, and reported total 330 plant species. Mehta (1997) have studied flora of Palitana. Nagar (2000) has worked on biodiversity of Barda hills. Nuranic (1996) in his Ph.D. thesis has given an account of phytosociological and ethnobotanical studies of Barda Hills. Dangar (2000) has surveyed the biodiversity of Saurashtra.

Important ecological studies conducted include Paliwal (1976) on grasses and Jain (1976) grasslands near Rajkot. Menon (1979) studied phytosociology of Saurashtra, and enumerated total 1090 plant species. Patel (1982) have worked on ecological survey near Bhavnagar. Reddy (1986) have noted ecological studies of grasslands near Bhavnagar. Kumar (1987) have compiled coastal vegetation of Saurashtra coast. Katrogadda (1988) have studied the ecosystem analysis of grasslands. Bhattacharya (1991) has worked on agro-ecosystem in Saurashtra region. Kotiwar (1995) worked on ecological and floristic aspects of Gir forests and noted total 431 plant species. Panchal and Pandey (2001) studied on herbaceous vegetation of a forest grassland of Rajkot district. Similarly, Patel (2002) has worked on biodiversity in Rampara Wildlife Sanctuary near Rajkot and noted total 278 plant species. Salvi (2006) surveyed the coastal vegetation in Gujarat with reference to Marine National Park and enumerated total plant species.