Chapter-1

"Such a Time-machine be there,
Which takes me far behind,
I feel,
What a pleasant and wonderful it would be
If I had been there at the time of Hooker,
And at least being one of his eighteen collectors,
I explore my Darjeeling, my land,
The then land,
Not a concrete forest,
Not the 'Triple Ts', but,
Only the middle 'T'
That was
Green, intact and virgin"

INTRODUCTION

'Green forest is a wealth of a Nation.' Economy of a nation greatly depends with its structure, topography and ultimately with its Biodiversity. For that, any nation should have a clear knowledge of its vegetational wealth for its sustainable and scientific use and proper conservation. The Great Himalayas, being proud of India, it always influences the nation in various aspects. Its flora had given rise to the ancient medicine system '*The Ayurveda*'. Since the early stages of human development, man always remained associated with nature and the Plants, not as today, where they are being gradually detached with the nature.

Darjeeling is a Himalayan district situated in the northern-most portion of the Indian state of West Bengal in the foot of the Great Kanchanjangha system of the Himalayas with geographical extent of 26° 27'05" and 27° 13'10" N latitude and 87° 59'30" and 88° 53' E longitude. (www.darjeeling.gov.in)

1.1 THE HISTORY

It is believed that the name '*Darjeeling*' is derived from two different religious sources, one, from the Buddhist root Tibetan word '*Dorje-ling*' where '*Dorje*' the celestial specter or double headed thunderbolt and '*ling*' is the land. Thus it literally means the 'Place of thunderbolt' (L. S. S. O' Malley 1907); and the other from the Hindu root, the Sanskrit word '*Durjay Ling*', where '*Durjay*' means one which is very tough to win and '*Ling*' is the '*Shivalinga*', here referred to hill spur especially of the Observatory Hill of Darjeeling. So, the meaning in this sense is invincible prowess who rules the Himalayas. (Das 1986; Bhujel 1996; Rai 2002; Lama 2004; Rai 2006).

The district has been emerged in the present day's form through various conflicts between the then three Himalayan countries Sikkim, the Kingdom of Bhutan and Nepal and the mighty British India. Initially prior to the 18th century, the whole area of today's Darjeeling district was under Sikkim. During the rule of Tensung Namgyal the 2nd Chogyal, Sikkim lost the area of Kalimpong to Bhutan. In the mean time in 1789, the Gorkha army from Nepal attacked the then Sikkimese capital of Rabdentse, and annexed the Darjeeling territories up to the western slope of Tista River, along with the plains around Siliguri into

Nepal (Dasgupta 1999). After the Anglo-Gorkha War, by virtue of the Treaty of Sugauli in 2nd December 1815, Nepal has to cede almost one-third of it's territories to the British which included portions of present Uttarakhand and Himachal Pradesh to the west, some territories of present Uttar Pradesh and Bihar to the south and to the east, the invaded area from Sikkim which included the hills and the Terai area between the rivers Mechi and Tista, i.e. the land of present Darjeeling, Kurseong and Siliguri sub-divisions. Later the British reinstated these land area between rivers Mechi and Tista to Sikkim again as per the Treaty of Titalia, on 10 February 1817, thereby, making a buffer state between India and Tibet. Again on 1st February 1835 with the request by the then Governor general Lord William Bentinck, the Maharajah of Sikkim had to donate this piece of land on compensatory ground to the British rulers for establishing a summer capital and a sanatorium for the sick officers and soldiers as a friendly gesture, instead the remainder of kingdom of Sikkim became a 'Protected State' by the British Empire (Dasgupta 1999).

On the other hand, after the defeat of Bhutan in the Anglo-Bhutan war followed by the Treaty of Sinchula on 11 November 1865, the land area east to the Tista River, i.e. the present Kalimpong sub-division along with the Dooars was annexed from Bhutan to the British India on a lease basis. These newly acquired areas of Kalimpong was first put under the Deputy Commissioner of Western Dooars, but in 1866 it was transferred to the District of Darjeeling giving the district its final shape, though its administrative *placement kept on changing from Rajsahi province to Bhagalpur province (Bhujel 1996; Das 2004).*

The role of "Botany" and the eminent botanical explorers like Sir Joseph Dalton Hooker and Dr. Arthur Campbell in the creation of this district is also not forgettable. While exploring the British India in 1849, they crossed the Rangit River and were moving towards Gangtok, when they were suddenly captured and imprisoned for few weeks by the Sikkimese. For this the Sikkim-British relation deteriorated. The British East India Company sent an expeditionary force to free them and the hostilities of Sikkim ceased without any bloodshed. Consequently due to the decreasing friendship between Sikkim, the clever Britishes ceased all the compensations (an annual grant of Rs.6000) for Sikkim resulted in the annexation of 640 square miles (1,700 km^2) of territory comprising the entire 'Sikkim Morung or Terai' i.e. the present Siliguri sub-division and in the hills of the whole southern part of Sikkim, between the Great Rangeet and the plains on the west of Teesta river. Finally by 1866 after the Treaty of Sinchula (1865), the whole area of present Darjeeling came under the administrative jurisdiction of the Company (Dasgupta 1999).

Prior to 1861 and from 1870 – 1874, as in Sikkim, the acts and regulations of the British India Govt. did not automatically apply in the district unlike rest of the country, unless specifically extended, therefore Darjeeling the District was a "Non-Regulated Area" at that time. From 1862 to 1870, it was considered a "Regulated Area" where these acts were affected. In 1874, the term "Non-Regulated Area" was changed to "Scheduled District" and again to "Back Ward Tracts" in 1919. Finally from 1935 until the independence of India the district was known as "Partially Excluded Area" (Khawas 2003).

From the above history it is clear that the Darjeeling District along with the Terai and Dooars was originally parts of Sikkim and Bhutan. Sikkim was merged to the Indian Union as the 22nd state on 16th May 1975. But at the time of Independence of India in 1947, Sikkim was also a sovereign country as Bhutan, hence a problem was arisen at the time of independence that how the portion annexed from the Himalayan countries be kept under the occupation of India as it could not be return to its original masters. Therefore, there was no other alternative way except to merge it with West Bengal as its boundary was contiguous. So, finally the Darjeeling district was annexed to the state of West Bengal as an automatic incident in 1947. The three hill sub-divisions of the district had been kept under separate administrative Settlement of the Darjeeling Gorkha Hill Council (DGHC) from 22nd August 1988 (West Bengal Act XIII of 1988; published in the Kolkata Gazette, Extraordinary, 15 October, 1988), which recently on 18th July 2011, upgraded into an autonomous body of the Gorkhaland Territorial Administration (GTA) (West Bengal Act XX of 2012, the Gorkhaland Territorial Administration Act; published in the Kolkata Gazette, Extraordinary, 12 March, 2012).

The *Lepchas*, who call themselves "*Mutanchi-Rong-kup*" or "*Rongpa*" or only "*Rong*", were, perhaps, the indigenous inhabitants of Sikkim and Darjeeling in the lap of the Great and Lower Himalayas

(S. Debnath, ISBN 9788186860427; Subba 1992). They were followed by other tribal groups of the region like *Limbus, Kiratas (Rais), Tamangs, Sherpas* and *Magars* of East Nepal Himalayan origin who lived here together since long. Although, since the late 18th century the hills are mostly inhabited by Nepali speaking Gorkhas a generic category composed up of at least 20 distinct sub-ethnic groups, each with its own culture and tradition which includes the above mentioned tribes as well as *Khas (comprising Bahun, Chhetri, Sanyasi, Thakuri etc), Newar, Gurung, Bhujel, Sunuwar, Kami, Damai, Sarki, Thami (Thangmi), Yakkha (Dewan), Yolmo (Kagatey)* and so on (Morris 1933, Rai *et al* 2007). The plains of Terai are multilingual and heterogeneous in nature for its ethnic composition. Here Bengalese have emerged as the major inhabitants in the urban and semi-urban areas while a greater bulk of Rajbanshis (Koches), Gorkhas and Mech tribes in the rural villages. 'The terai plains were unhealthy marshy tract formerly covered by dense malarious jungles, in which aboriginal tribes of Meches, Dhimals and Koches burnt clearings and raised their scanty corps of rice and cotton on a system it can be called, of nomadic husbandry. It has now been extensively cleared for tea gardens and settled villages' (O'Malley 1907). The tea garden belts in the Terai and Dooars are inhabited by tribal Adivasis (Sautal, Oraon and Munda etc. indigenous of Chotanagpur, Santhal Parganas and the western part of West Bengal) and Gorkhas (Ghosh 2006; Sarkar 2011; Ghosh *et al* 2008). Other communities like Marwaris, Biharis etc. and other communities reside in the town area in quite low proportion. There is also a sizable population of Tibetans who arrived from Tibet since 1950s in the towns and adjoining areas of Darjeeling, Ghoom, Kalimpong and Siliguri. Although, the various sub-ethnic groups of the Gorkhas have their own distinct culture and tradition and even the linguistic identity, but all of them use *Nepali* as *lingua franka*. The same for the plains is *Bengali* in towns and *Rajbanshi (Kamtapuri)* in the villages (S. Debnath, ISBN 9788186860427).

1.2 THE BIODIVERSITY AND VEGETATION STRUCTURES

1.2.1 Vegetation of Eastern Himalaya

Covering a transverse stretch of 850 km (Gansser 1964), along the Himalayan mountains, the Eastern Himalaya comprise different phytogeographic regions of Eastern Nepal in the west to Arunachal Pradesh in the east covering throughout the portion of Darjeeling-Sikkim and Bhutan parts of the Himalayas. The Eastern Himalaya is well known for its rich biodiversity and is considered to be a store house of innumerable number of plant species [Grierson & Long 1983; Hara 1966]. The Himalayan landmass, due to having with congenial climate and extremely variable habitat, has created a favourable situation for development of extremely rich vegetation (Das 1994, 2004, 2011). Even today, though much less but some areas of Eastern Himalaya are covered with spotless ancient forest with no sign of human interference. These virgin forests contribute highest forest cover in India (FSI 2003). About 10,000 species of vascular plant from the Himalayan region have been estimated of which at least 39 % are endemic (Myers 1989, 1990; CI 2004). This region exhibits the richest flora in the Indian phytochorion (Indian sub-continent) (Rao 1994). The Indian phytochorion is very rich in relict species content (Naithani 1990, Sharma 2000).

The Eastern Himalaya is also well known for the high proportion of endemicity of its flora. It is recognised as one of the 3 mega-centers of endemic plant species in India which harbors maximum number of endemics. The region alone accounts 1808 out of 5725 endemic species found in India (Nayar 1996; Bhujel 1996; Rai 2006; Das 2011). Some of the plant taxa like Orchids, Rhododendrons, bamboos, *Hedychium* show a very rich representation with high degree of endemism for the region. 650 species of orchids are reported from the Eastern Himalaya out of c. 1200 species known from India, 58 species of 100 known species of bamboo in India, 70 out of 82 species of *Rhododendron* and 34 of 60 species of *Hedychium* of the world are reported from the Eastern Himalaya. A recent account of floral investigation of Darjeeling-Sikkim and Bhutan Himalaya have recorded 579 species of Orchids, 381 Grasses, 370 Asters, 180 Sedges, with 277 species of Fabaceae, 176 of Scrophulariaceae, 169 Rosaceae, 153 Rubiaceae, 112 Rananculaceae, 117 Lamiaceae, 110 Euphorbiaceae, and 99 species of Gentinaceae accumulating

4025 dicot and 1519 monocot with total of 5544 species of Angiosperms. (Grierson & Long 1983–1994; Noltie 1994, 2000; Pearce & Cribb 2002, Lucksom 2007). New distributional records for numerous taxa and even novel taxa are publishing regularly from different parts of the Eastern Himalaya (Rai et al 2007; Subedi & Shakya 2008; Maden 2008; Raskoti et al 2008; Raskoti & Shakya 2009; Samanta & Das 2009; Kumar et al 2009; Panda *et al* 2009a,b; Kumar & Paul 2010; Das *et al* 2010; Vaidya & Shakya 2011a,b; Das & Yadav 2011; Shakya 2011; Yonzone et al 2012; Buragohain et al 2012; Rai & Das 2012; Moktan et al 2012; Joshi & Siwakoti 2012).

One of the most important factors for such a great endemism is considered to be the position of region which is bounded by snow capped Himalayan range in the north and great Gangatic plain in the south which act as geographic barriers for the migration of plant species to other parts. Another factor for the enrichment of floristic elements of the Eastern Himalaya is the mixture of Himalayan, Sino-Himalayan, SE Asian–Malaysian, Eurasian, Central Asiatic, Afro-Asiatic and the elements of Indian mainland. And, that is why Indian Subcontinent is regarded as the region for the meeting ground for diverse flora of the Eastern Hemisphere (Shrestha 1982; Das 1986, 1995, 2004). Das (2004) stressed on the long distance to and from migration of species along the Himalayas in different 'climatic tiers'.

Most of the plants of the Eastern Himalayan region are found to be distributed to some extended areas in northern Myanmar and Tibet Autonomous Region (TAR) and the Yunnan portion of Southern China. This area is regarded as one of the important centers of speciation (Das 1995). Considering this fact Takhtajan (1969) regarded Eastern Himalaya along with NW Myanmar and Yunnan as the 'Cradle of Angiosperm'.

But, unfortunately, the natural vegetation of the Himalaya is being continuously been destroyed through anthropogenic interferences and that leads to the dramatic changes in the environment which have been witnessed during recent years, might be disastrous for the existence of all Himalayan organisms. Himalaya is the most newly borne and geologically very young land form and possesses the very weak and unstable geology which can easily be degraded. In addition, the monsoonal climate with heavy and prolonged rainfalls, humid climate and undulating terrain with diversified landforms are the natural factors which help soil degradation and erosion causing heavy landslides in these regions. Further the process has been aggravated due to rapid and dangerous explosion in human population (Basu S. R. 2000).

1.2.2 Vegetation of Darjeeling Himalaya

As being an integrated portion of the Eastern Himalaya the Darjeeling district also exhibits the indigenous characters of the Himalayas. Assemblage of west Asian – Eurasian to south-east Asian – Malaysian and Indian in addition to Himalayan floristic elements is one example out of these characters (Das 2002, 2004). Possession of 1,204 km^2 (38.23 %) under forest cover (FSI 2001) out of its 3149 km^2 of total geographic area; coverage of wide altitudinal range from 98 to 3660 m amsl, extreme variability in climatic, physical, topographical and geographical conditions, highly complex terrain and other abiotic (recently it is mostly anthropogenic) factors have resulted in a wide variations in the habitat throughout the district ultimately resulted the development of wide diversity of vegetational communities in different climatic zones (Bhujel 1996; Samanta & Das 1995,1999; Rai 2001; Bhujel & Das 2002; Das 1986, 1995, 2004, 2011; Rai 2006; Ghosh 2006). Such diversity and heterogeneity of habitat has also supported for development and evolution of species. Every exploration of the district, although most of those are partial, has recorded some the occurrence of some new species within the jurisdiction of Darjeeling district and it is also believed that the process of speciation in the area is still continuing (Das 1995, 2004; Das & Chanda 1998; Das & Lama 1992; Kumar *et al* 2009, Paul *et* Kumar 2012; Das *et al* 2008, 2010; Moktan *et al* 2012; Yonjan *et al* 2012; Nirola *et* Das 2014).

The Darjeeling Himalaya is part of the Himalaya Biodiversity Hotspot (CI 2005). The region is extremely rich in flora and fauna with high level of endemism. The climatic and edaphic isolation of the sub-Himalayan region have resulted in the high percentage of endemism. Results from relentless and

extensive works of Das (1986, 1995, 2004, 2011), Das & Chanda (1987), Bhujel (1996), Bhujel & Das (2002), on the flora of Darjeeling hills have reflected a very interesting picture on endemic species. In accordance with some latest studies Bhujel (1996) and Bhujel & Das (2002) listed over 400 dicot species from Darjeeling district endemic to Eastern Himalaya and North-East India of which 29 species endemic for the district. Das (1986 & 2004) reported 2137 species of flowering plants from Darjeeling Himalaya of which 21.26 % were endemics for local and regional level. Likewise, Rai (2001) recorded over 14 % of plant taxa as endemic to Himalaya from Neora Valley National Park.

But at the same time the area of original vegetation is shrinking at an alarming rate. Vegetation structure of Darjeeling has changed greatly after the British took over the region and initiated different so called developmental programs. According to one of the earliest travellers in the district, the mountains in 1830 were completely clothed with forests from the top to the every bottom (O'Malley 1907). But the scenario has almost totally been changed during the next century. Entire lower and middle hill areas including the highlands in the Terai are converted to tea gardens. Due to rapid urbanization, the upper belt of the forest was taken for commercial use. Much of the natural forests in the Senchal, Ghum-Simana and Takdah ranges have been converted to *Cryptomeria* forest. Introduction of exotic tree species by the forest department, especially fast growing high timber value species like *Cryptomeria japonica, Tectona grandis* etc have destroyed the ground flora to some extent (Das & Lahiri 1997). Many of them have now naturalized and replacing the indigenous species. The biological resources of Darjeeling Himalaya are facing threats due to almost uncontrolled increase in anthropogenic activities leading to rapid habitat destruction and excessive fragmentation, spread of invasive exotic species etc. (Das, 1995, 2004; Rai 2006).

Based on altitude, the forests of Darjeeling were classified by Dash (1947) as Lower hill forest up to 970 m, Middle hill forest (970 – 1940 m) and Upper hill forest (1940 – 2900 m). According to Grierson & Long (1983) the Eastern Himalayan forest (based on Bhutan Himalaya) can be divided into five zones as Lowland / riverine forest (under 1000 m), Lower montane forest (1000 – 1500 m), Deciduous forest (1500 – 2100 m), Pine and coniferous forest (2100 – 3500 m) and Alpine grassland and scrub (above 3500 m). Bhujel (1996) has classified the vegetation of Darjeeling district in five major types as Tropical Zone (120 – 500 m), Sub-Tropical Zone (500 – 1200 m), Sub-Temperate Zone (1200 – 1850 m), Temperate Zone (1850 – 3200 m) and Sub-alpine Zone (3200 – 3700m) with further few sub-types for some types. The natural forests of the district engrave a enormous source of timber, medicine and many other economically important plants and numerous NTFPs. Some of the important timber yielding species of the region include *Shorea robusta, Tectona grandis, Castanopsis hystrix, Schima wallichii, Quercus lineata, Q. llamellosa, Terminalia bellirica, T. alata, T. chebula, Abies densa, Alnus nepalensis, Betula utilis, Duabanga grandiflora, Exbucklandia papulnea, Mallotus nepalensis, Chukrasia tabularis, Michelia champaca, Magnolia campbellii, Cryptomeria japonica, Pinus roxburghii, Acer campbellii, A. thomsonii, Tsuga dumosa, Gmelina arborea, Lithocarpus pachyphylla* etc.

Medicinal and ethno-medicinal values of the plants of Darjeeling district have frequently been estimated during the last three decades. Das & Mondal (2003) has recorded 92 species of plants used as folk medicine by the hill people, Rai (2002) has extensively studied over ethno-medicinal plants and reported 421 species. Majority of those are being used as medicinal also narrated in Ayurveda are endowed with rare and endangered species of high altitude medicinal plants. Yonzon *et al* (1984), Rai & Sharma (1994), Rai & Das (1996), Rai *et al* (1998), Rai & Bhujel (2002), Das *et al* (2006, 2008, 2010, 2011), Sarkar & Das (2010, 2011), Ghosh & Das (2011) have also contributed much in this field in their past studies. Common important medicinal and aromatic plants of Darjeeling inludes *Acacia catechu, Acorus calamus, Artemisia vulgaris, Artemisia indica, Emblica officinale, Terminalia chebula, T. bellirica, T. alata, Syzygium cumini, Berberis aristata, Heracleum nepalense, Drymeria cordata, Eupatorium glandulosum, Rhododendron arboretum, Dichroa febrifuga, Dactylorrhiza hatageri* and *Dioscorea deltoidea.*

1.3 CONSERVATION OF BIODIVERSITY

The unprecedented rate in the increase of human population, which has crossed 5 billion world-wide, is the major concern for the survival of biodiversity. Increase of human population and the extraction of natural resources are directly proportional. Direct exploitation of species for food, fodder, fuel, medicine, etc is a major threat to biodiversity world wide. As a consequence, large areas of forests are getting wiped out and many in the line to meet the same fate. The underlying causes of biodiversity loss, however, are poverty, macro-economic policies, international trade factors, policy failures, poor environmental law and its weak enforcement, unsustainable developmental projects and lack of local control over resources (Wood *et al* 2000). For these all reasons thinking of global conservation of biodiversity has been arisen by virtue of which, birth of the agency like The International Union for Conservation of Nature and Natural Resources (IUCN), WWF, Birds Life International, ATREE, etc has been taken with the aim of biodiversity conservation world wide.

For this sense of conservation Mc Neely *et al* (1990) recognizes 12 countries including India those contribute 70 % of the world's flora as the mega diversity countries (Groombridge 1992). Myers (1989, 1990) brought in the concept of '**Hotspot**' based on the total endemics and the rate of natural habitat loss. Initially, 13 hotspots were recognized world wide of which two were covering Indian Territory. The figure was revised to add 12 more regions totalling 25 (Myers *et al* 2000). The IUCN added 10 more regions to the already existing list. Now there are 35 Hotspots recognized world-wide (CI 2012). And, recently one more Hotspot along the Eastern coast of Australia has been recognized. The distribution of these 35 Hotspots are as follows (Fig. 1.1):

Table 1.1. Worldwide distribution of the Hotspots

East Asia and Asia-Pacific	8
Africa	8
South America	5
Europe and Central Asia	4
North and Central America	4
Indian Sub-continent	3
Australia & New Zealand	3
Total:	**35**

The mountains of the Himalayas including the Eastern Himalaya are globally important so far as the biodiversity is concerned. Many attempts are being adopted for the conservation of the myriad of biodiversity of the mighty Himalaya. The whole of the Himalayas has now been included among the 35-biodiversity hotspots over the globe (Myers *et al* 2000; IUCN 2010), this includes several eco-regions (Olson & Dinerstein 1998), two Endemic Bird Areas and several protected centres for plant diversity (IUCN 1995). Previously, this region was included under the Indo-Burma Hotspot but now it is located within the territory of Himalaya Hotspot.

It is being realized that the biodiversity throughout the world is being gradually affected by the direct and indirect intervention of human being. In addition, natural calamities as drought, floods, landslide, soil erosions etc are also responsible to some extent for the loss of the biodiversity. Hence, it is felt that unless immediate and effective measures are not taken, we may tend to loose some of our important living resources before knowing their potential economic use (Lepcha 2011).

Therefore, realizing the facts of gradual depletion of biodiversity from the fragile ecozone the government has taken initiative to conserve those potential species of flora and fauna declaring Wildlife Sanctuaries, National Park and reserve forests.

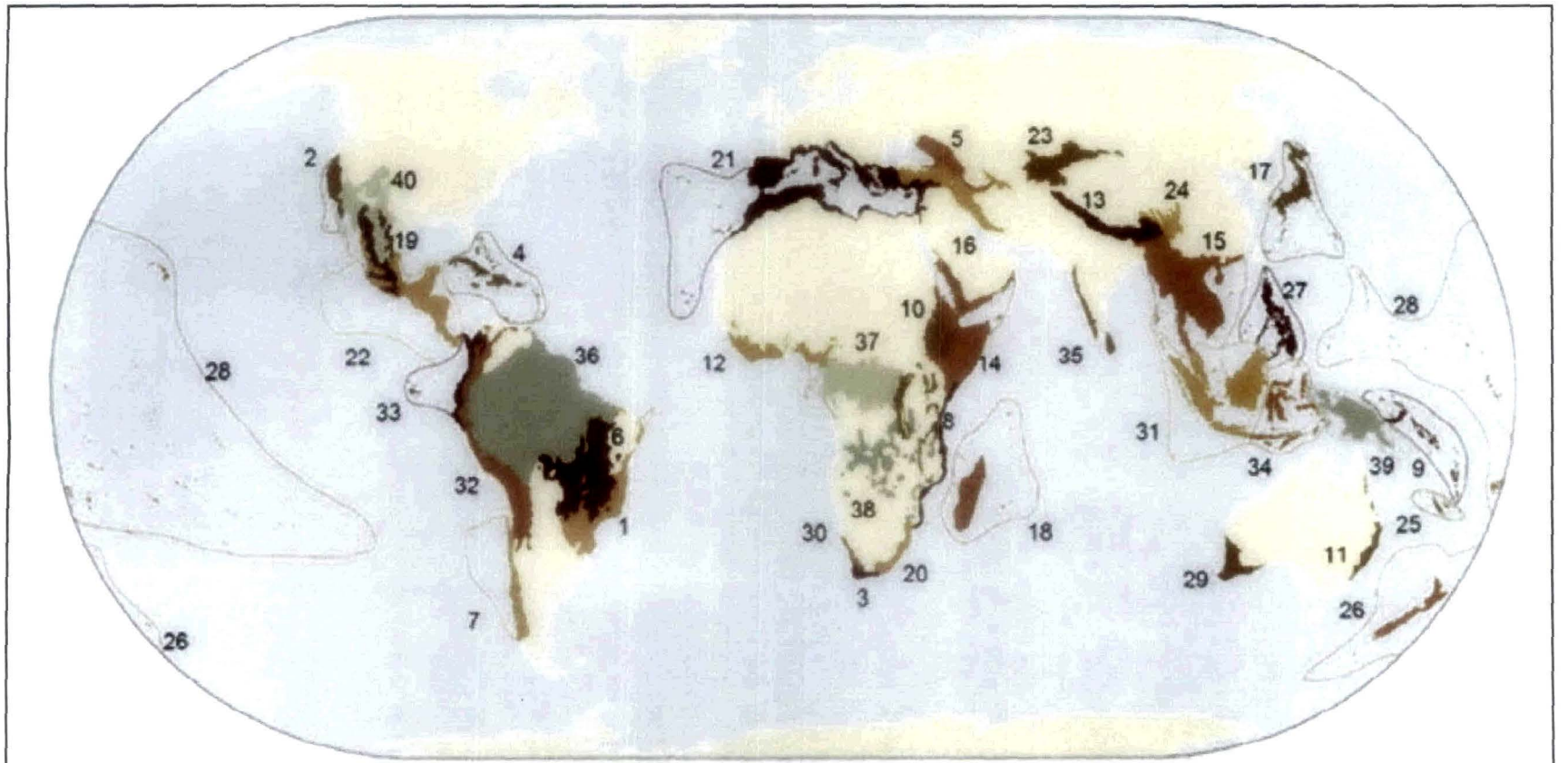

Fig. 1.1. Biodiversity hotspots (regions 1–35): 1: Atlantic Forest; 2: California Floristic Province; 3: Cape Floristic Region; 4: Caribbean Islands; 5: Caucasus; 6: Cerrado; 7: Chilean Winter Rainfall-Valdivian Forests; 8: Coastal Forests of Eastern Africa; 9: East Melanesian Islands; 10: Eastern Afromontane; 11: Forests of East Australia; 12: Guinean Forests of West Africa; 13: Himalaya; 14: Horn of Africa; 15: Indo-Burma; 16: Irano-Anatolian; 17:Japan; 18: Madagascar and the Indian Ocean Islands; 19: Madrean Pine-Oak Woodlands; 20: Maputaland-Pondoland-Albany; 21: Mediterranian Basin; 22: Mesoamerica; 23: Mountains of Central Asia; 24: Mountains of Southwest China; 25: New Caledonia; 26: New Zealand; 27: Philippines; 28: Polynesia–Micronesia; 29: Southwest Australia; 30: Succulent Karoo; 31: Sundaland; 32: Tropical Andes; 33: Thumbes-Chocõ -Magdalena; 34: Wallacea; 35: Western Ghats and Sri Lanka.

1.3.1 Biodiversity Protected Areas

Keeping view of protection of the biodiversity of the area, two National Parks and three Wildlife Sanctuaries have been established within area of the district which occupies a total of 333.56 km^2 area. In addition to these there are numerous reserved and un-reserved forests especially along the river valleys and the ridges of higher hills. Details of the National parks and Wildlife sanctuaries are given below (Table 1.2 and 1.3): [*Source*: State Forest Report, West Bengal, 2010 – 2011]

Table 1.2. Wildlife Sanctuaries (IUCN Category- IV) in the Darjeeling district

Name	Area (km^2)	Location	Date of Establishment	Beats Covered
Senchal WLS	38.88	Ridges above Sonada to 6th Mile (Darjeeling Division); 26° 94' – 27° 07' 26" N & 88° 24 '– 88° 35' 43" E)	24.06.1976	6th Mile, 3rd Mile, (Simkuna) Jorebunglow, Rambhi and Sonada; 1100 – 2600 m
Mahananda WLS	158.04	Foothills between Tista, Mahananda and up to Balasan rivers (Kurseong Division); 26° 76' 54" – 26° 96' 91" N & 88° 31' 80" – 88° 48' 47" E)	24.06.1976	Kalijhora, Lathpanjar, Punding, Sukna, Gulma, Toribari, Sevoke, 7th Mile and Laltong; 150 – 1000 m
Jorepokhari Salamander Sanctuary	0.04	Ridge above Sukiapokhari (Darjeeling Division); 26° 70' 91"–26° 79' 59" N & 88° 21' 51" – 88° 31' 11" E	11.03.1985	Jorepokhari; 2300 – 2500 m

Table 1.3. National parks (IUCN Category- II) in the Darjeeling district

Name	Area (km^2)	Location	Date of Establishment	Beats covered
Neora Valley NP	88.00	Eastern portion of Kalimpong sub-division (Kalimpong Division); 26° 52' 03" – 27° 07' 35" N & 88° 45' – 88° 50' E	17.04.1986	Rachila, Thosum, West Nar & East Nar; 200 –3100 m
Singalila NP	78.60	North-Western portion of the district (Darjeeling Division); 27° 03' 05" – 27° 22' 06" N & 87° 59' 30" – 88° 07' 87" E	06.05.1986	Phalut, Sabargram, Rammam, Sandakphu, Kalapokhari & Gairibans; 2150 – 3636 m

The district stands in second position with respect to other districts of West Bengal in terms of forest area covered. It occupies 10.14 % of forest area comparing the total of that of the state and 0.153 % of the Nation. Table 1.4 shows a comparison of total geographical area, covered forest area and the percentage of forest area of different districts in W. B. and that compared with the data of whole nation. [*Source*: State Forest Report, West Bengal, 2010 – 2011]

Table 1.4. Comparison of Total Area, Forest Area and Percentage of forest area of different Districts in West Bengal

District	Total Area (km^2)	Forest Area (km^2)	% age of Forest Area
24-Parganas (S)	10,159	4,221	41.54%
Darjeeling	3,149	1,204	38.23%
Jalpaiguri	6,227	1,790	28.75%
Bankura	6,882	1,482	21.53%
Purulia	6,259	876	14.00%
E & W Medinipur	14,081	1,709	12.14%
Other districts	42,016	597	1.42%
Total (W. B.)	**88,773**	**11,879**	13.38%
All India	**3,287,240**	**7,86,437**	23.92%

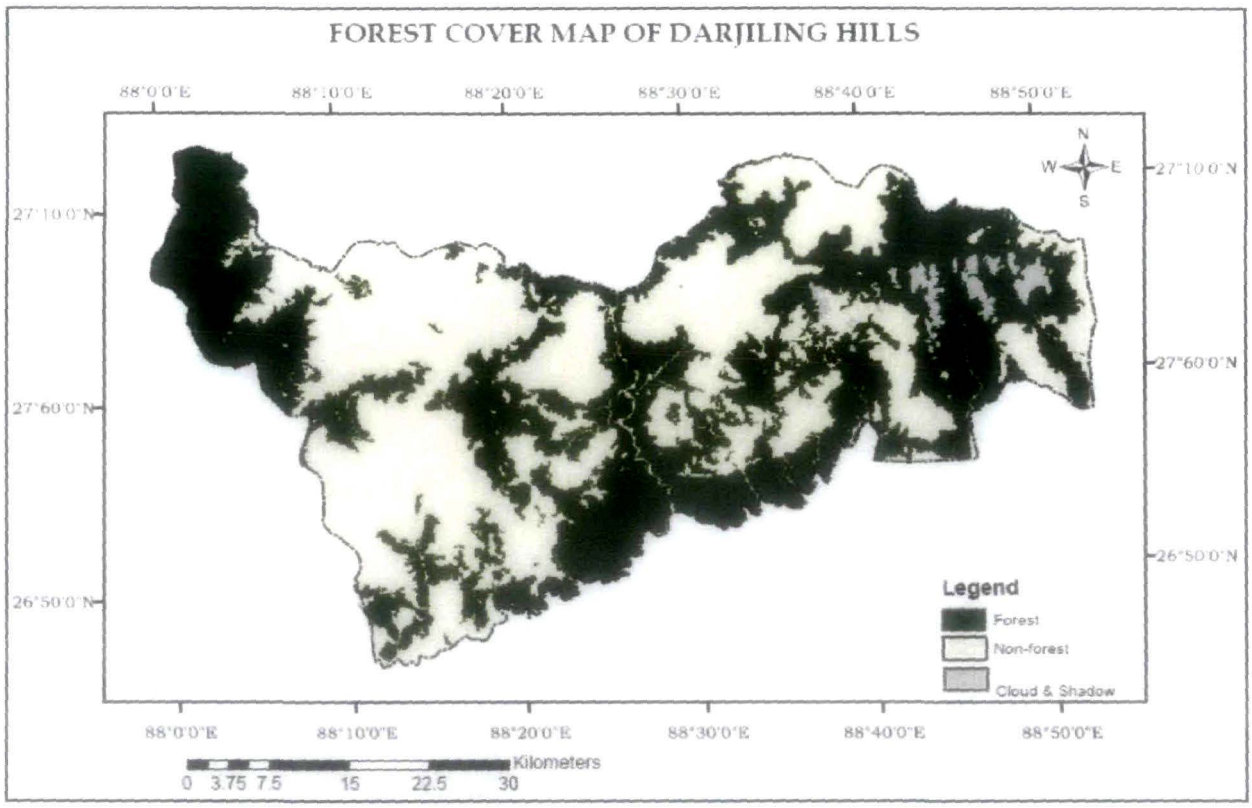

Figure 1.2. Forest Cover Map of Darjeeling Hills

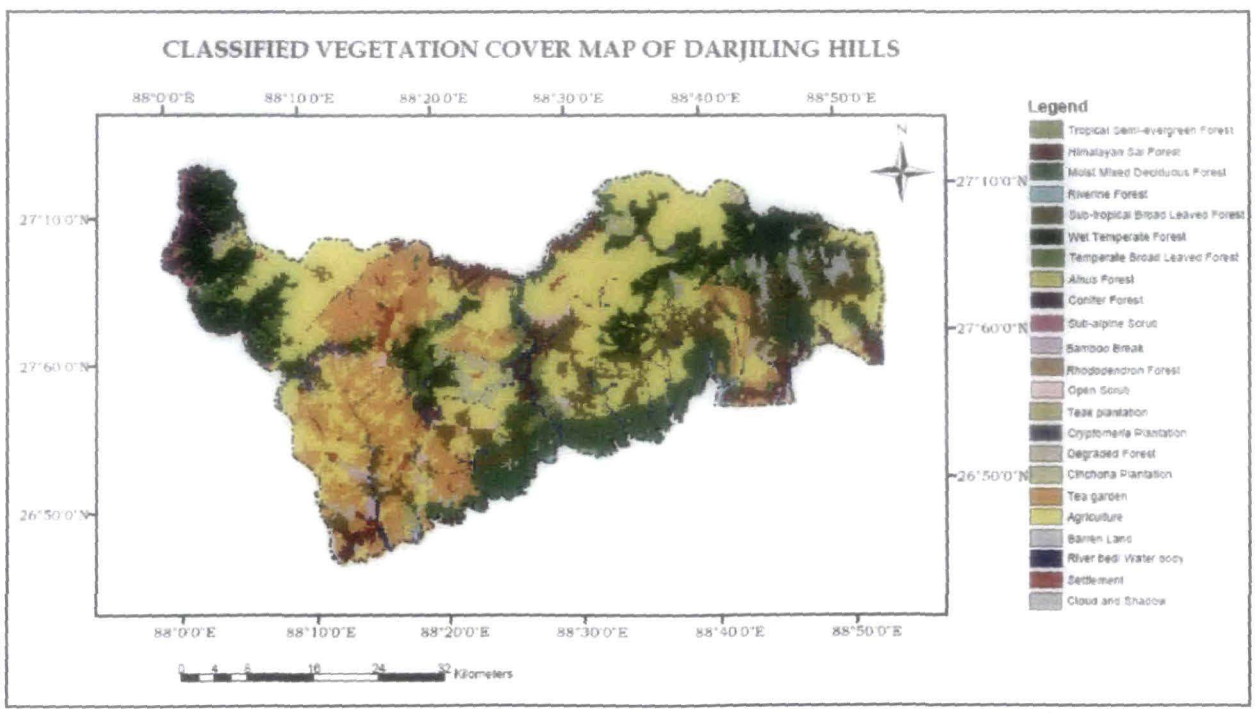

Figure 1.3. Classified Vegetation Cover Map of Darjeeling Hills [*Source*: Rai 2006]