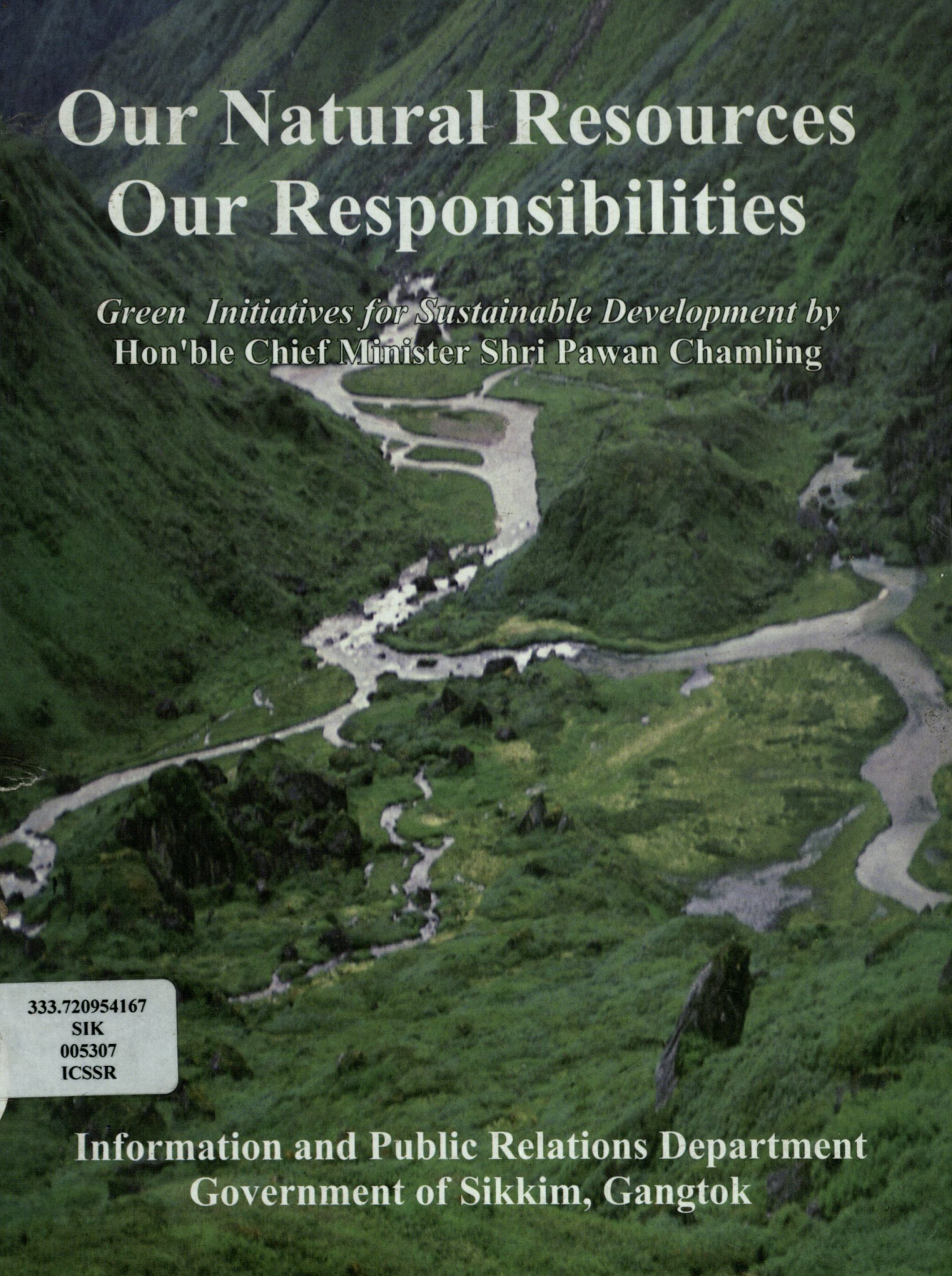
Our Natural Resources Our Responsibilities

Green Initiatives for Sustainable Development by
Hon'ble Chief Minister Shri Pawan Chamling



Information and Public Relations Department
Government of Sikkim, Gangtok

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State Flower
Dendrobium Nobile

State Tree
Rhododendron *niveum*

The Himalaya May Change You,

But Please Do Not Change The Himalaya!

State Animal
Red Panda
Ailuras Fulgens

State Bird
Blood Pheasant

CONTENTS

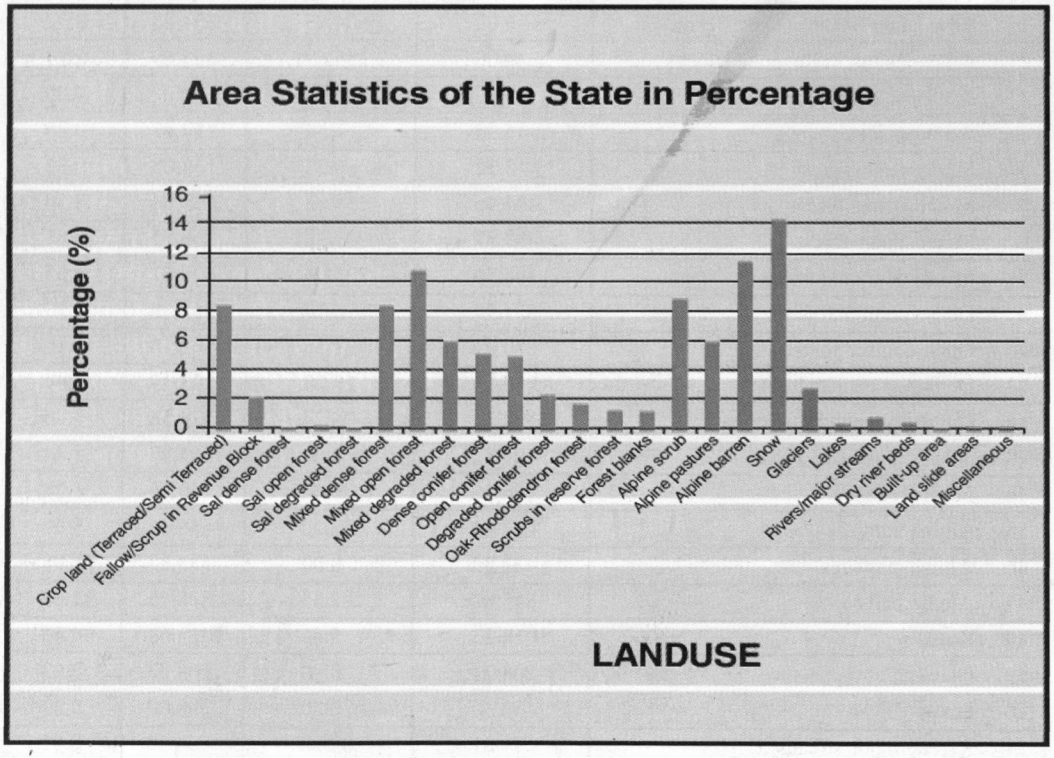
INTRODUCTION

Sikkim is a small mountainous State in the Eastern Himalayan region extending approximately 114 km from North to South and 64 km. from East to West, having a total geographical area 7096 sq. km. only. The State is situated between 88° 00' 58" and 88° 55' 25" East longitudes and 27° 04' and 28° 07' 48" North latitudes. It is surrounded by vast stretches of Tibetan plateau in North; Chumbi valley & Kingdom of Bhutan in the East; Darjeeling district of West Bengal in South and Kingdom of Nepal in West. The State has four districts namely East, West, North & South, Nine sub-divisions & eight towns.

AREA STATISTICS FOR SIKKIM – TOTAL STATE (IN SQ. KMS.)

Sl. No.	CLASS	RESERVE FOREST	REVENUE BLOCK	TOTAL	%OF TOTAL
1	Crop land (Terraced/Semi Terraced)	0.00	604.85	604.85	8.52
2	Fallow/Scrub in Revenue Blocks	0.00	155.69	155.69	2.19
3	Sal dense forest	5.30	0.77	6.07	0.09
4	Sal open forest	15.93	1.54	17.47	0.25
5	Sal degraded forest	3.32	0.71	4.03	0.06
6	Mixed dense forest	464.46	138.88	603.34	8.50
7	Mixed open forest	433.37	333.38	766.75	10.81
8	Mixed degraded forest	194.56	235.06	429.62	6.05
9	Dense conifer forest	351.94	16.14	368.08	5.19
10	Open conifer forest	340.63	21.55	362.18	5.10
11	Degraded conifer forest	156.89	16.30	173.19	2.44
12	Oak-Rhododendron forest	100.34	26.24	126.58	1.78
13	Scrubs in reserve forest	101.87	0.00	101.87	1.44
14	Forest blanks	90.56	0.00	90.56	1.28
15	Alpine scrub	611.44	27.72	639.16	9.01
16	Alpine pastures	431.32	0.00	431.32	6.08
17	Alpine barren	815.80	2.35	818.15	11.53
18	Snow	1018.23	5.41	1023.64	14.43
19	Glaciers	208.23	0.00	208.23	2.93
20	Lakes	32.30	0.70	33.00	0.47
21	Rivers/major streams	31.81	32.50	64.31	0.91
22	Dry river beds	31.49	9.10	40.59	0.57
23	Built-up area	0.30	3.24	3.54	0.05
24	Land slide areas	5.37	5.16	10.53	0.15
25	Miscellaneous	6.93	6.30	13.23	0.19
	TOTAL	**5452.39**	**1643.59**	**7095.98**	**100.00**

The State is bestowed with abundant natural resources. Covering just 0.2% of the geographical of the country, it has tremendous biodiversity and has been identified as one of the **Hot Spot** for biodiversity. The Sikkim Himalayas that spread over Sikkim and the hill region of Darjeeling harbors more than 26 % of the flowering plants reported in the country and known to be an important phytogeographical reserve of the country. Species wise, it has approx. 5000 Flowering plants, 515 Orchids, 36 Rhododendrons, 16 Conifers, 23 Bamboos, 362 Ferns and Ferns allies, 8 Tree Ferns, 60 Primulas, 11 Oaks, over 424 medicinal plants, 150 Mammals, 552 Birds, 48 Fishes and over 690 nos. of Butterflies and also 28 nos. of Mountains/Peaks, 21 Glaciers, 227 High altitude lakes & wetlands and over 104 rivers and streams. The Sikkim Himalayas has excellent scope for value added eco-tourism and traditions, unique in Art, Culture, and Folks dances live in perfect harmony and it is one of the most peaceful states in the country. There is strong sense of community living with distinct commitment in the people to serve the society. They have the strong sense of volunteerism.



The Himalayas is our country's pride and is a symbol of value systems. They are, in almost every way superlative. They are the highest mountain range on Earth, with just about all of the highest mountain in them, they form one of the greatest physical and cultural barriers, and they are stupendously beautiful, still relatively unspoilt, and full of fascinating human and

natural life. In many cases, the way of life has remained almost totally unchanged by the modern inventions and it is like going back hundreds, or even thousands of years. They are today exposed to accelerating environmental and social changes; although change is inevitable and desirable when it improves the living conditions. A comprehensive study on the environmental and social changes in the entire Himalayas may be the need of time to identify and justify the methodology of change, which is consistent with preservation of Himalayan Values, Heritage, Natural resources, Spectacular natural beauty and distinctive culture/ tradition of the area.

The Tenth Chogyal (Maharajah) of Sikkim after completing his studies in Oxford University in 1908 was given the charge of Forests, Monasteries and Schools. The Forest Department was constituted in 1909. As per notification dated 15.05.1911 (F.D.), the Maharajah of Sikkim was declared a "**Forest Officer**." In 1909 the then Maharajah of Sikkim, Sidkeong Tulku, initiated the demarcation of the forest areas of the then Kingdom of Sikkim. Forests that were vital to the life support system and required full protection were set apart as Reserve Forests. These forests were to be left in their natural state and heavy penalties were imposed for illegal activities in these areas. Other forest areas that could be worked on a small scale in order to meet the timber and fuel-wood requirements of the local populace were carved out in the vicinity of villages. Those forests that were set apart in this manner to meet the wood requirements of the local people were called Khasmal Forests and those that were set apart as grazing grounds for the village cattle were called Goucharan Forests. Forest rules and regulations were first of all instituted during this period. He also introduced Avenue plantation of trees on either side of bridle paths of Sikkim through public participation. He passed regulations for conserving 50 yards on either side of rivers Rangit, Teesta and their tributaries as river / khola reserves. He passed regulations for compulsory bench terracing of the cultivable land of the farmers. "Whoever tills the land must bench-terrace."

Physiographically, Sikkim can be said to have its feet in the ocean and its head in the sky. The altitudes vary from 300 meters to 8500 meters above mean sea level. The entire state is a young mountain system with highly folded and faulted rock strata at many places. It encompasses the lesser Himalayas, Central Himalayas and the Tethys Himalayas. Great Mountain ranging from 3000 meters to 8500 meters in height separates the state from surroundings. In fact, it has no flat piece of land good size any where. Major portion is covered by the pre-Cambrian rock and is much younger in age. The rock type consists of phyllites and schist's and therefore, the slopes are highly susceptible to weathering and prone to erosion and landslides. The trend of the mountain system is in general east-west direction. The mountains rise in elevation northward. The northern portion of the state is deeply cut into steep escarpments, and except in the Lachen and Lachung valleys, is not

populated. Southern Sikkim is lower, more open, and fairly well cultivated. This configuration of the state is partly due to the direction of the main drainage which is southern. The Rangeet and the Teesta which form the main channels of drainage, run nearly North-South. The valleys cut by these rivers and their chief feeders are very deep. The valleys are rather open towards the top, but usually attain a steep gorge like structure as we approach the bed of the rivers. There are 227 perennial lakes /wetlands at different altitudes. Many hot water springs i.e. Phur sachu, Ralang Sachu, Yumethang, Momay are also found in the State. The perpetual snow line in Sikkim may be approx. at 16,000 ft.

Soil of the region being the nutrient medium, is indispensable in vegetations. Soil moisture, mostly depending upon the soil thickness has an explicit impact on forest type and coverage in an area. The entire state primarily consists of gneissose rocks and half-schistose rocks. The soil developed from the gneissic group of rocks is brown clay, generally shallow and poor. They are typically coarse, often with ferric concentrations, neutral to acidic with poor organic/mineral nutrients. They tend to carry most of the evergreen and deciduous forests. The high intensity of rain fall in the state often causes extensive soil erosion and heavy losses of nutrients of land by leaching.

Climatically Sikkim experiences variable temperature with summer in the foothills and freezing winter on the high mountains. The climate of the state has been divided roughly into the tropical, temperate and alpine zones. The general trend of decrease in temperature with increase in altitudes holds good every where. For most of the period in a year, the climate is cold and humid as rainfall occurs in each month. The area experiences a heavy rainfall due to its proximity to the Bay of Bengal. The state receives an average annual rainfall of 500 cm. which is the highest in the Eastern Himalayas. The high density of rainfall causes extensive soil erosion and frequent landslides. The pre-monsoon rain occurs in April-May and the monsoon occurs normally from the month of May and continues up to early October. The temperature varies with altitudes and slope. While in lower altitudinal zones the mean temperature varies between 4.5^{0}C to 9.5^0 C. The maximum temperature is recorded usually during the month of July & August and minimum during December & January. During the period from May to September fog becomes a common feature in this area. Also during winter snowfall in common in common high altitude places. The mean temperature in the lower altitudinal zones varies between 4.5 degree centigrade to 18.5 degree centigrade, whereas at higher altitudinal zones, it varies from 1.5 degree centigrade to 9.5 degree centigrade. Temperature varies with altitude and slope. The maximum temperature is recorded usually during July & August, And minimum during December & January. Fog is a common feature in the entire State from May to September. Biting cold is experience at high altitude places in the winter months and snowfall is also not uncommon during this period.

Sikkim is a multi-ethnic state. Broadly, the population can be divided into Tribal and Non-Tribal groups. The people from the plain mostly involved in Trade and services represented a marginal group. As per the 2001 census of India, the total population of the state is 5, 40,493, whereas in 1991 it was 4, 06,457 only. Decadal population growth has gone up for 1991-01 to 32.98% .as in 1981-91 it was only 28.47%. The overall density of population in the state is 76 per sq. km. East district is the most populated as North's density only 7, is least populated. Sex ratio (Females per thousand Male) is 875. The State (at National Level) has the literacy rate 69.68% (16^{th}), Fertility rate 2.75 (12^{th}), Infant Mortality rate 52 (13^{th}), Index of Social & economic infrastructure 108.99 (9^{th}), Plan expenditure in social sector 45.38% (4^{th}), Access to safe drinking water in % of households 73.19 (6^{th}), Per capita consumption of electricity 182 Kw H (25^{th}), & Per capita income is Rs.11,356 (14th). There are 166 Panchayats and 453 Revenue Blocks , which comprise of 32 Assembly Constituencies.

The forest of the state exhibit diversified variety of flora and fauna. The myriad life forms of both plants and animals that characterize this bio-geographical region are unique in India and perhaps in the whole world. Sikkim being a high rain fall region encompasses within its narrow belt a luxuriant floristic composition ranging from tropical screw pines to alpine Primulas. The state is renowned for its Rhododendron and Orchids as also high altitude Primulas, Meconopsis and blue puppies. The flora of Sikkim is also esteemed for several medicinal plants. Sikkim is also rich in faunal wealth and Himalayan animals such as Snow Leopard, Musk Deer, Blue sheep, Himalayan Tahr and rare pheasants are found in several parts of the pristine spots and virgin forests of the state. The lakes fed melting snows are the habitat of a number of resident and migratory water fowls and for birds.

The State of Sikkim, by virtue of its topography is connected with only one transport mode i.e. road transport. The other modes of transport viz. Rail, Air and Waterways are not available in this state. Keeping in pace with the development of the state, the Government of India helped in preparation of a master plan for road development in this region. The plan includes construction of new roads and bridges, up-gradation of narrow roads, road development in as many villages as possible and replacement of old weak bridges. With the rapid development of road network in the state, increased traffic facilities are on demand. With this objective in view, Sikkim Nationalized Transport, a departmental commercial undertaking was put into operation in 1955 to meet the growing demands of passengers and goods traffic. Since then, substantial achievement has been made in developing infrastructure in terms of number of buses and trucks in the fleet, coverage of passenger traffic and goods traffic. It is seen that on an average 17% growth in goods traffic and 16% growth in-passenger traffic has taken places during the seventh plan period. The road development

had achieved a significant mark in extending the road networks in the state to the extent of 1515 kms by the end of 1991-92. By the year 2002-03 the road length has been increased to 2750 kms. This includes the construction of new surfaced roads and surfacing of unsurfaced roads.