### ENVIRONMENTAL INITIATIVES OF THE STATE GOVERNMENT (1994-2016)



Forest, Environment and Wildlife Management Department Government of Sikkim

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Pawan Chamling Chief Minister of Sikkim

## Message



03592-202575 (O) 03592-202304 (R) E-mail: cm-skm@hub.nic.in Gangtok-737103, Sikkim

Sikkim is a green, biodiversity-rich and environmentally endowed eastern Himalayan State. It falls within one of India's two biodiversity hotspot regions and is well-known for its enormous number of flora and fauna. The unique natural features of the State have attracted scientists and naturalists through the ages and eminent scientists like Joseph Dalton Hooker have spent considerable amount of time exploring its verdant hills and valleys. Natural elements of the State have been revered and celebrated by different communities and forms a part of their folklore, songs, dance and rituals.

In the last 22 years, the State Government has taken several steps towards conserving the environment as I believe that its preservation is of paramount importance for our future security. We have initiated and put in place measures such as ban on grazing of cattle and green felling in reserved forest areas, prohibition on manufacture, use and sale of firecrackers, prohibition on use of plastic carry bags and prohibition on burning of agricultural wastes. To complement these conservation steps I personally thought about novel programs for augmenting our green resources such as Ten Minutes to Earth, State Green Mission and Paryavaran Mahotsav, which have become popular in the State and the country as well. Environment education must go hand in hand with these steps and I firmly believe that the student community have a role to play in safeguarding our environment. Environmental education has been introduced from class VIII in all government schools, along with green awards for schools so that the students inculcate environment-friendly activities in their day to day lives. To honour the religious sentiments of the people, certain peaks, lakes and rocks have been notified as sacred and nature worshipping festivals have been declared as government holidays.

In recognition of all these steps initiated by us, the State has won several accolades such as The Greenest Chief Minister Award, Nirmal Rajya Puraskar, two of our districts have been declared cleanest in the North-East, and finally, recently the Khangchendzonga National Park has been declared as a UNESCO World Heritage Site.

I am pleased that the Forest, Environment & Wildlife Management Department has brought out this book faithfully recording all these achievements of the last 22 years of my governance. I am sure readers will find this book interesting and informative and will appreciate my sincere effort to conserve our natural resources and address climate change mitigation in our small but beautiful State.

Pawan Chamling Chief Minister





Tshering Wangdi Lepcha Minister for Forest, Environment & Wildlife Management, Mines, Minerals & Geology, Science & Technology and Climate Change Department, Government of Sikkim.

### Foreword

Environment Wildlife The Forest. & Management Department is responsible for management and protection of Sikkim's exquisite flora and fauna contained within 82% of the geographical area of the State and to manage wildlife within the 8 protected areas of the State. Even though this responsibility is being discharged to the best of its ability, the State Government under the visionary leadership of Shri Pawan Chamling has made landmark decisions and initiated unique steps to ensure that the State's image is maintained as an environment-friendly destination.

Programs like ten minutes to earth, state green mission, paryavaran mahotsava, organic farming, environment education in school curriculum, green awards and several others, conceived by the Honourable Chief Minister himself, have ensured that the State's forest cover has increased by 4% in the last 20 years to reach 47.80% of the geographical area of the State. Ban on plastics, on grazing in reserved forests, on use of firecrackers, on burning of wastes and on use of plastic bottles are aimed to preserving the sanctity of our environment. We have enormous biodiversity in our State with more than 4000 flowering plants, more than 500 wild orchids, more than 400 butterfly species, 36 rhododendrons, about 30 bamboos, a number of rare and endangered mammals and so on. These are conserved because of the environment friendly policies of the government under the direction of Shri Pawan Chamling.

In this book we have tried to capture all these unique features followed by the Government in Sikkim in the last 22 years. I am pleased that the Forest, Environment & Wildlife Management Department has brought out this book for the information of policy makers, students, teachers, media, bureaucrats and the public generally to highlight the exemplary work being carried out in Sikkim.

> Tshering W. Lepcha Minister



03592-280228 (O) 03592-281778 (F) E-mail: twlepcha0@gmail.com Gangtok-737102, Sikkim

q.





## Preface

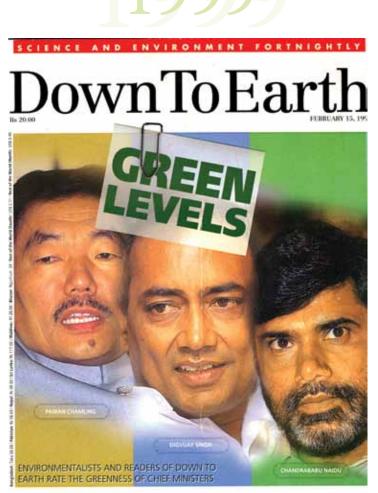
The last 22 years have seen phenomenal changes in the policies and actions relating to forests, wildlife and environment generally in Sikkim. These changes, triggered by the imaginative and visionary leadership of the Honourable Chief Minister Shri Pawan Chamling, have produced noticeable results in the State. The forest cover of Sikkim has increased by about 4% in the past two decades and stands at 47.80% of the geographical area of the State now. New species have been recorded by the scientific community thereby enriching the State's biodiversity further. The quality of life has vastly improved and the pristine environment contributes to it.

This book entitled "Environmental Initiatives of the State Government 1994-2016" is a sincere effort on the part of the Forest, Environment & Wildlife Management Department to showcase the achievements of the State Government in the last 22 years. The book has been divided for convenience into eight chapters each devoted to a section of activity. As pictures speak better than words, the achievements have been illustrated with pictures to the extent possible. I hope the readers will find the contents useful and educative.

I wish to place on record the excellent support that I received from my colleagues in the Forest, Environment & Wildlife Management Department who assisted me in putting together the script and pictures of this book by devoting their time and effort.

**Dr. Thomas Chandy** Principal Secretary-cum-Principal Chief Conservator of Forests

### Awards and Recognition in Forestry, Environment and Wildlife sector



Shri Pawan Chamling, Chief Minister of אואוא was adjudged the Greenest Chief Minister of India by Delhi-based Centre for Science and Environment (1999)

Shri Pawan Chamling, Chief Minister of Sikkim was adjudged the "Greenest" Chief Minister of India by Delhi-based Centre for Science and Environment (CSE).



India Today ranked Sikkim as 1<sup>st</sup> amongst twelve eastern states of India in overall performance during the 4<sup>th</sup> State of States Conclave at New Delhi.



22008

Government Secondary School, Daramdin, West Sikkim was awarded the "Greenest" School of India in terms of water management under the Gobar Times Green Schools Programme by Centre for Science and Environment.



Rashtirya Nirmal Gram Puraskar for Sikkim: In a glittering award giving ceremony, Sikkim earned the distinction of being the first State in the country to achieve 100 percent sanitation. The award including citation and a gold medal was given away by the President of India, Smt. Pratibha Patil to the Chief Minister of Sikkim, Shri Pawan Chamling.

2008

Environmental Sustainability Index (ESI) 2008 prepared by Chennai-based Centre for Development Finance (CDF) adjudged Sikkim as

- 1<sup>st</sup> Rank/ Best in Natural Resource Management
- 1<sup>st</sup> Rank/ Best in Reducing Pressure on Environment



## FIFMR 2 0 0 9

#### Sikkim Stands High on Top in Environmental Sustainability Index for Indian States -2009

Centre for Development Finance (CDF) at the Institute for Financial Management and Research (IFMR) ranks Sikkim 1<sup>e</sup> among the Indian States in Reducing Pressure on Environment and in State's Responses to maintain their Environment for the year 2009.

Sikkim States on the right of y-axis are doing Namlard better than states on the left. For states chai Pra on the right side, longer the bars, the less pressure is on its environment. For states on the left side, longer bars mean more pressure on environment. All values are in standardized scores. Likewise, in 2008 Sikkim was adjudged 1" among the Indian States in Karriatak Conservation of Natural Resources and Most Sustainable in Performance in Land Use. More Sustainable **Environmental Sustainability Index** Medium Sustainable (ESI) is a comparative analysis of Tarril No Littler Pro-Less Sustainable environmental achievements, Least Sustainable challenges and priorities among the Gutarat Indian State. It is designed to sensitize, -1.500 0.000 1.500 inform and empower citizens and es to r policy makers. Chlvin **Arunachal Prad** ESI tracks the environmental chal Pro performance of 28 States of India and tries to capture the state of environment. in multiple dimensions based on 44 variables aggregated into 15 indicators which in turn are aggregated as an index i.e. Environmental Sustainability Index (ESI) More on ESI and how the states have fared in different aspects of Most Sustainable sustainability can be accessed from the website. More Sustainable www.greenindjastandards.com Medium Sustainable Less Sustainable Least Sustainable 1.500 0.000 1.500 ENVIS Bi-Annual Newsletter 2010-11 Edition 1 | PANDA Volume III Issue No. 27 600

ESI 2009 rated Sikkim as

- 1st Rank/ Best in Reducing Pressure on Environment
- 1st Rank/ Best in State's Response to Maintain Environment

CSE awarded three Sikkim Schools under Gobar Times Green Schools National Award 2010;

- Government Secondary School, Reshi, West Sikkim (Top 10 of India)
- Government Secondary School, Linkey, East Sikkim (Best Manager in Air)
- Government Secondary School, Namcheybong, East Sikkim (Best Manager in Energy)

# 22011]

CSE awarded two Sikkim Schools under Gobar Times Green Schools National Award 2011;

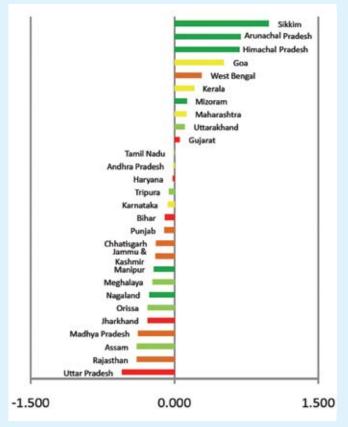
- Government Secondary School, Middle Camp, East Sikkim (Top 10 of India)
- Government Secondary School, Lower Samdong, East Sikkim (Top 10 of India)





Organic Certification accredited by the National Programme for Organic Production (NPOP), India for wild harvest of products (Aconitum heterophyllum - tuber/root, Chiretta - whole plant, Seabuckthorn - berries fruits, Seabuckthorn - juice fruits) by Sikkim State Cooperative Supply and Marketing Federation Ltd.





2012

ESI 2011 released by CDF on June 5, 2012 rated Sikkim as

- Environmentally most sustainable State of India
- Best in State's Policy Response



CSE awarded three Sikkim Schools under Gobar Times Green Schools National Award 2012;

- Government Secondary School, Dentam, West Sikkim (1<sup>st</sup> Rank)
- Government Girls Senior Secondary School, Deorali, East Sikkim (2<sup>nd</sup> Rank)
- Government Secondary School, Tingley, South Sikkim (4th Rank)







CSE awarded two Sikkim Schools under Gobar Times Green Schools National Award 2013;

- Government Secondary School, Penlong, East Sikkim (2<sup>nd</sup> Rank in New School Category)
- Government Secondary School, Tingley, South Sikkim (2<sup>th</sup> Rank in Changemaker category)





CSE awarded two Sikkim Schools under Gobar Times Green Schools National Award 2014;

- Government Girls Senior Secondary School, Namchi, South Sikkim (New School Category)
- Government Secondary School, Lower Samdong, East Sikkim (Change makers category)
- 1. Khangchendzonga National Park declared as one of the top 100 global green destinations by a consortium of top global agencies working on environment and sustainable tourism.



ENVIS *(Environmental Information System)* Centre at Forest, Environment & Wildlife Management Department, Government of Sikkim was ranked 1<sup>st</sup> among 68 ENVIS Centres in India by the Ministry of Environment, Forests & Climate Change, Government of India.

# 2015

Gangtok ranked among the top 10 cleanest cities in India and third among the State capitals according to the *Swachh Bharat* ranking done by the Union Urban Development Ministry during August 2015.

Gangtok awarded as Cleanest Hill Station of the country by India Today Group at the Safaigiri Awards 2015.

Government Senior Secondary School, Hee-Yangthang, West Sikkim awarded Paryavaran Mitra Puraskar for being one of the best two exemplar schools of the country for 2015 by the Centre for Environment Education, Ahmadabad on 11<sup>th</sup> January, 2016.





WIPRO, Bangalore awarded Government Secondary School, Bongten, West Sikkim as Best Earthian school amongst top 15 earthian schools of the country and also awarded T. N. Khoshoo Memorial Award on the basis of its project "Sustainability and Biodiversity". The school was awarded certificate and cash prize of Rs. 1.00 lakh during the awards function held on 5<sup>th</sup> February 2016 at Bangalore.





ENVIS *(Environmental Information System)* Centre at Forest, Environment & Wildlife Management Department, Government of Sikkim was awarded the Best State ENVIS Centre of the country by the Ministry of Environment, Forests & Climate Change, Government of India. The certificate has handed over by Shri Prakash Javadekar, Minister of State (Independent Charge) Environment, Forests and Climate Change during the inaugural function of National Evaluation workshop of ENVIS Centres held on 17<sup>th</sup> February 2016 at New Delhi.

CSE awarded three Sikkim Schools under Gobar Times Green Schools National Award 2015;

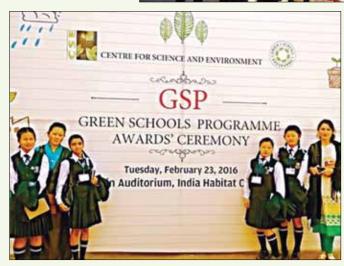


 Sonam Choda Lepcha Memorial Government Secondary School, Lingdong, Upper Dzongu North Sikkim (Rank 4)

 Government Junior High School, Mangzing, South Sikkim (Rank 8)

2016





• Government Girl's Senior Secondary School, Geyzing, West Sikkim (First school to complete and submit audit report online)

The green leaf trophies and certificates were presented on 23<sup>rd</sup> February 2016 at Stein Auditorium, India Habitat Centre, New Delhi.



West District of Sikkim bagged the 'Cleanest District of India' award on the occasion of the 10th Civil Service Day awards ceremony in New Delhi held in April 2016.



The Chief Minister of Sikkim Shri Pawan Chamling received 'Certificate of Recognition' along with a cash prize of Rs. 5.0 lakhs for making Gangtok the cleanest city in the North-East India from the Prime Minister of India Shri Narendra Modi at Shillong during May 2016. Chief Minister of Sikkim Shri Pawan Chamling also received 'Certificate of Recognition' for making Sikkim the first open defecation free State in the North-East India.

### Khangchendzonga National Park (KNP)

fulfils UNESCO's criteria for both natural and cultural heritage, and is the first site in India to be awarded the status of a mixed World Heritage Site on 17 July 2016 by the World Heritage Committee at Istanbul, Turkey.



Chapter II

# World Heritage Site -Khangchendzonga National Park



hangchendzonga National Park (KNP) is situated in North and West Districts of Sikkim and includes the world's third highest peak, Mt. Khangchendzonga. KNP has an extremely impressive altitudinal range: a vertical sweep of 7,366 meters (m) across an elevation range of 1,220 m to 8,586 m above sea level (asl) within a relatively small area. The Himalayas are narrowest here resulting in extremely steep terrain which magnifies the distinction between the various eco-zones which characterise the area. As a consequence, KNP contains a remarkable range of Eastern Himalaya landscapes and wildlife from sub-tropical to alpine to Trans-Himalayan (Cold Desert) within a small geographical area. Culturally, the National Park is significant as it is considered to be the core of the sacred hidden land or "beyul" which was blessed by Guru Padmasambhava. Mount Khangchendzonga itself is revered as it is regarded as the guarding deity of all Sikkimese people.

On account of these natural and cultural features, Khangchendzonga National Park was declared as a World Heritage Site in July 2016 based on both natural and cultural criteria (or mixed criteria), **India's first mixed criteria World Heritage Site**.

#### **Natural Values of KNP**

KNP has an area of 178,400 hectares and covers approximately 25% of the entire State. KNP was declared in 1977 and its area was more than doubled in 1997 by the State Government to protect an area of spectacular peaks, glaciers and rugged alpine terrain in the Indian part of the Eastern Himalayas. The 1997 extension broadened the range of ecosystems covered and increased the impressive altitudinal gradient.

India's highest peak, Khangchendzonga, at 8,586 m asl, literally stands out within the protected area which boasts of 20 peaks above 6,000 m. the visually prominent Khangchendzonga Massif is actually comprised of five major peaks, which culturally stand for the five treasures salt, gold, turquoise, arms and (combined) medicine and seeds. The massif literally named the "Abode of the Gods", has exceptional symbolical, cultural, religious and spiritual significance for many ethnic peoples and religious beliefs across and beyond the Himalayas.

Numerous lakes and glaciers, including the 26 km long Zemu Glacier dot the barren high altitudes. The glaciers feed important rivers, creeks and wetlands within the seven major watersheds of the KNP. The park boasts of an unusually diverse flora and fauna with many rare and endangered species, some of them endemic. The different altitudinal zones provide habitat for markedly distinct faunal and floral assemblages. Eleven broad vegetation types have been identified, each confined to specific elevation ranges and topographic niches and each with corresponding faunal assemblages. Recent camera trapping confirms that the mammal species encompass numerous rare and endangered species and probably the full array of



naturally occurring predators. Asiatic Black Bear (VU) and at least four canines, including the elusive Asiatic Wild Dog (EN) and the Tibetan Wolf (CR) have recently been confirmed. The Snow Leopard (EN) is the flagship species of KNP, one of the three leopard species and six confirmed (possibly eight) cat species found within KNP. The charismatic Red Panda (EN) is the State Animal of Sikkim and is likewise found in

A family of Blue Sheep Pseudois nayaur



the lower altitude forests of KNP, its buffer zone and nearby protected areas. Among the insects, butterflies are extremely abundant in Sikkim State which is home to an estimated 46% of India's butterfly species. Sikkim boasts of up to 650 species.

KNP coincides with an Important Bird Area (IBA) and is part of Endemic Bird Area (EBA). Among the most conspicuous bird species are the many large birds of prey, several species of Old World Vultures and numerous pheasants (LC). The Lhonak Valley is a Trans-Himalayan grassland, which is partially included in KNP and the only known breeding site of the Blacknecked or Tibetan Crane (VU) in the Eastern Himalayas as well as an important stopover for migratory water birds.

KNP along with the adjacent reserve forests is home to some 22 endemic, rare and threatened plant species. The national park provides habitat for Snow Leopard, the largest Himalayan carnivore and a globally endangered species, other threatened species such as the Alpine Musk Deer (EN), Clouded Leopard (VU), Red Panda, Wild Dog and Asiatic Black Bear. KNP is part of the Eastern Himalaya EBA which hosts at least 127 bird species of conservation concern, including seven globally threatened and restricted range species. The property also covers most of an IBA which is one of the highest in the world. Birds from at least four biomes are found in this IBA due to its size and high elevations.

KNP's grandeur is undeniable and the Khangchendzonga Massif and other peaks and landscape features are revered across several cultures and religions. While not the highest mountain in the world, Khangchendzonga is nevertheless a peak with one of the most spectacular mountain ranges globally. The combination of extremely high and rugged mountains covered by intact old-growth forests up to the unusually high timberline further adds to the exceptional landscape beauty.

KNP was legally declared in 1977 and extended in 1997. The park is the equivalent of an IUCN Category II protected area and is strongly protected under India's national Wildlife (Protection) Act which includes elements of both area-based and speciesbased conservation and both are applicable to KNP.



#### Steps taken by the Government to preserve the biodiversity and ecosystems of the KNP:

Mobile pastoralism has been a central element of the traditional local livelihood systems in Sikkim, including what is today KNP, both in the form of transhumance and nomadism. The Government of Sikkim banned open grazing in 1998 in both protected areas and reserved forests, plantations and near water sources and embarked on stricter enforcement. Cattle sheds have since been removed from KNP. Trekking use is supported by pack animals resulting in some localized grazing impacts but generally the KNP is free from any major signs of overgrazing. A ban on the commercial exploitation of medicinal plants and aromatic plants used for incense was imposed in 2001 and continues even today. Hunting and trapping of birds and mammals has long been a part of traditional livelihood systems, both for food and medicinal purposes. It is today categorically banned, i.e., considered as poaching.

### The Cultural Significance of KNP

The core of the cultural significance of the property revolves around the notion of beyul or 'hidden land'. This concept is linked to the narrative on Guru Padmasambhava or Guru Rinpoche or Second Buddha, who visited Sikkim in the 8<sup>th</sup> century and sanctified the whole region naming it beyul or 'sacred hidden land', a paradise on earth. No boundaries were defined but the beyul was divided into Highlands, Midlands and Lowlands with Khangchendzonga sitting like a king on a throne, presiding over and protecting the upper region of the beyul.



Around the concept of beyul a number of religious texts and rituals have been elaborated. An important ritual associated with Khangchendzonga and the other guardian deities is the Pang Lhabsol, which was consolidated by the King of Sikkim in the 17<sup>th</sup> -18<sup>th</sup> century and is still performed annually. It includes an itinerary through the main Buddhist monasteries and notable natural features mentioned in sacred texts. This particular Buddhist ritual is interwoven with Lepcha rites, carried out by two shamans (bungthings) at the same time as Pang Lhabsol is performed - one in Northern and the other in Southern Sikkim. These rituals have been performed for over three centuries and along with the texts wherein they are described have played a crucial role in shaping Sikkimese identity and their relationship with the environment.

Tangible natural elements conveying the association with nature and making

intelligible the sacred geography of the nominated property include lakes, caves, sacred rocks and sacred peaks. Conversely, man-made elements of the links between humans and the natural environment are the monasteries, the chortens, and the ruins of royal palaces.

Religious records indicate that in the 8<sup>th</sup> century, Guru Padmasambhava, who consolidated Buddhism in Tibet and was revered as a Second Buddha visited Sikkim and sanctified the land. He introduced Buddhism to Sikkim and is said to have hidden sacred Buddhist books in hidden palaces in the mountains.

The arrival of the Bhutias from Tibet in the 13<sup>th</sup> century was also marked in the mythological history, which records the friendship treaty made between the Lepcha and the Bhutias. An eternal friendship was established with Khangchendzonga.

#### Steps taken by the Government to preserve the cultural significance of the KNP:

The Government of Sikkim has taken several steps to preserve the cultural significance of the KNP. In 2001, the State Government of Sikkim issued Notification No 70/ Home/2001 listing sacred peaks, caves, rocks, lakes, chortens and hot-springs as "most sacred Buddhist places of worship in Sikkim and protected them under the provision of the Places of Worship (Special Provision) Act, 1991" which was extended to Sikkim in July 1991.

The following natural elements and monuments located within the core zone of the KNP are protected under his Notification:

1. The peaks of Khangchendzonga, Mt. Kabru Gangtsen, Mt. Pandim, Mt. Simvo, Goecha Peak, Fork Peak and Mt. Siniolchu.

- 2. The rock of Yongdrok Drak
- 3. And the following five lakes: Phu Tsho Karpo/Omai Tsho

Sumoten Tsho

Dholoe Tsho

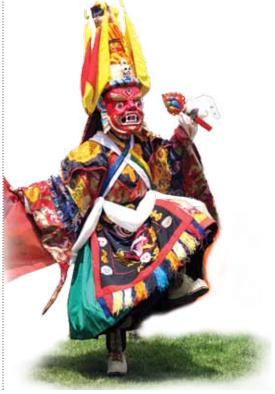
Kabru Lam Tsho

Yum Tsho / Mulithing Lake (Green Lake)

The sacred natural elements and monuments located within the KNP which have not yet been listed in the 2001 Notification, are already protected by the Wildlife Protection Act 1972.

The Forest (Conservation) Act, 1980 has laid down strict rules to ensure that ecological considerations are in no way undermined while examining investment proposals. The State Government or the Union Territory Administration concerned is required to envisage at the initial stage itself, the different likely impacts of any development projects and that no such projects be in the vicinity of scenic landscapes, areas of geomorphological significance, unique and representative biomes and eco-systems, heritage sites/ structures and areas of cultural heritage and importance amongst others.

Noticeable Government initiatives have been to maintain Pang Lhabsol and other Buddhist ritual celebrations as state holidays as in the days of the kingdom (which were declared holidays during the time of the kingdom), making it easier for people to attend and participate. An important state contribution towards the preservation of cultural values and religious history has been the introduction of vernacular classes in all government schools in the 1980s.





### **Criteria for Declaring as World Heritage Site**

### **1.** Superlative natural phenomena or natural beauty or aesthetic importance

The scale and grandeur of the Khangchendzonga Massif and the numerous other peaks within Khangchendzonga National Park are extraordinary and contribute to a landscape that is revered across several cultures and religions. The third highest peak on the planet, Mt. Khangchendzonga (8,586 m asl) straddles the western boundary of Khangchendzonga National Park and is one of 20 picturesque peaks measuring over 6,000 m located within the peak. The combination of extremely high and rugged mountains covered by intact old-growth forests up to the unusually high







timberline and the pronounced altitudinal vegetation zones further adds to the exceptional landscape beauty. These peaks have attracted people from all over the world, mountaineers, photographers and those seeking spiritual fulfilment. The park boasts of eighteen glaciers including Zemu Glacier, one of the largest in Asia, occupying an area of around 10,700 ha. Similarly, there are 73 glacial lakes in the property including over eighteen crystal clear and placid high altitude lakes.



#### 2. Biodiversity and threatened species

Khangchendzonga National Park is located within a mountain range of global biodiversity conservation significance and covers 25% of the State of Sikkim acknowledged as one of the most significant biodiversity concentrations in India. The property has one of the highest levels of plant and mammal diversity recorded within the Central/High Asian Mountains. Khangchendzonga National Park is home to nearly half of India's bird diversity, wild trees, orchids and rhododendrons and one third of the country's flowering plants. It contains the widest and most extensive zone of krummholz (stunted forest) in the Himalayan region. It also provides a critical refuge for a range of endemic, rare and threatened species of plants and animals. The national park exhibits an extraordinary altitudinal range of more than 7 kilometres in a relatively small area giving rise to an exceptional range of eastern Himalaya landscapes and associated wildlife habitat. This ecosystem mosaic provides a critical refuge for an impressive range of large mammals, including several apex predators. A remarkable six cat species have been confirmed (Leopard, Clouded Leopard, Snow Leopard, Jungle Cat (LC), Golden Cat (NT), Leopard Cat (LC) within the park. Flagship species include Snow Leopard as the largest Himalayan predator, Jackal, Tibetan Wolf, are Indian Civet (NT), Red Panda, Goral, Blue Sheep (LC), Himalayan Tahr (NT), Mainland Serow, two species of Musk Deer, two primates, four species of pika and several rodent species, including the parti-coloured Flying Squirrel (LC).



### **3.** It bears a unique testimony to a cultural tradition which is living

This criterion is justified on the grounds that the nominated property contains a number of sacred peaks, caves, rocks and lakes associated with worship practices of Sikkimese populations. For them, Mount Khangchendzonga, the other peaks and a great number of natural elements (e.g caves, rivers, lakes, waterfalls, rocks etc) are associated with mythological and cosmological stories and are the object of regular worship, kinship relations are also established between the mountains and the people.

Khangchendzonga is the focus of the rituals and festivals performed by the Sikkimese and by the Tibetan Buddhists as the abode of Dzonga, Sikkim's guardian deity who in the 17<sup>th</sup> century was also conferred the title of chief defender of the Dharma within Tibetan Buddhism.

The justification of this criterion is grounded mainly in the meanings and the sacred significance attributed to notable natural features located within and on the fringes of the nominated property and appears mainly associative in nature. However, Buddhism has integrated these beliefs and has consolidated them through the precise description of the natural elements to be venerated in sacred texts which are regularly recited in the assemblies of the Sikkim monasteries.

#### 4. It is directly associated with events or living traditions with ideas or with beliefs with artistic and literary works of outstanding universal significance.

This kinship is expressed by Mount Khangchendzonga being revered as Mayel Lyang by the indigenous peoples of Sikkim and as a beyul (sacred hidden land). This role is sustained by regularly performed rituals.





Monks go every year to the vicinity of the peak of Khangchendzonga to perform a ritual which is believed to bring benefits well-being and prosperity to the whole Sikkim population. It is a specific Sikkimese form of sacred mountain cult.

An even more important ritual is performed at the end of the monsoon season in all Sikkimese monasteries and is known by the name of *Pang Lhabsol;* it celebrates Mount Khangchendzonga as a deity protecting the territory and giving peace and prosperity and it can involve dances with elaborate masks.



Golden Cat dark var. WII-KNP

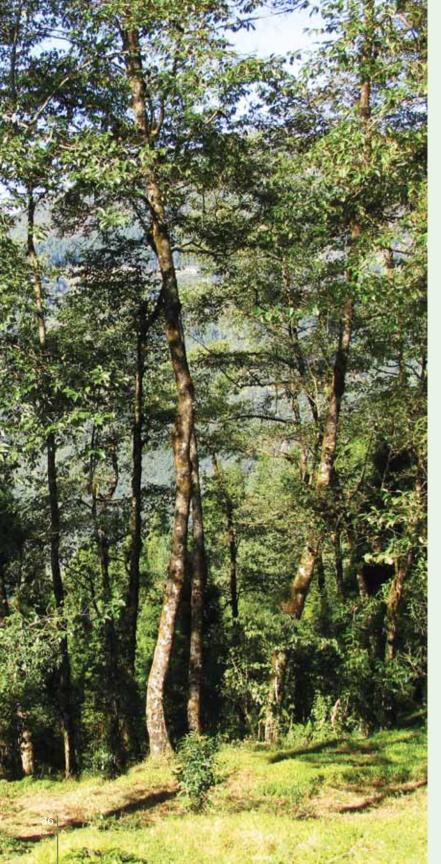
### Chapter III

# Forestry

# **The Green Revolution**

ikkim had a past history of timber extraction from forests by demarcating clear felling coupes in rich forest areas. This had resulted in several barren patches of forest lands in both temperate and sub-tropical forest belts. Overgrazing and concentrated collection of firewood especially in the vicinity of towns also resulted in forest blanks or degraded lands. The need of the hour was to launch a people's movement to initiate and sustain forest growth and reverse the trend of depleting forest cover and poor quality of forests.

The Chief Minister gave a clarion call to all Sikkimese to contribute to greening of their home land and the year 1995 was declared as the Harit Kranti Year or Green Revolution Year for forestry and the first decade of the current millennium 2000-2010 was declared the Harit Kranti Dashak or Green Revolution decade. The objective of doing this was to inspire people to protect greenery wherever it was present by avoiding damage to trees and to encourage them to plant trees and nurture them wherever open spaces were to be found to increase the green cover of the State. This was borne out of the Government's conviction that in a Himalayan State a green revolution is of paramount importance to provide environmental security to the people and an insurance against natural disasters like landslides and flash floods. Forest department nurseries were tasked to grow saplings on



a war footing to supply the increased need for saplings which were distributed free of cost for people to plant on their homesteads or on government land. There were large-scale afforestation programs and protection of natural resources through people's participation was intiated. This was the beginning of an era of environmental resurgence in the State targeting an increase in forest cover and stabilization of hill slopes.

While massive afforestation efforts were taken up everywhere in the State a simultaneous stop to the logging of trees was also necessary to make the green revolution complete. This was also put into place through a ban on the felling of trees in Reserved Forests and export of timber outside the State was also prohibited. Forest protection, wildlife and environmental conservation in the hills of Sikkim became the prime focus of the Government. Legislations, rules and guidelines were either put in place or revised and amended to make them more stringent in line with this new policy framework of a green revolution in forestry.



# Augmenting ecosystem services through banning of grazing

Sikkimese rural society is basically agrarian and livestock keeping is an integral part of the hill agricultural system. Grazing in forest areas was allowed to bustiwallas from time immemorial in recognition of this. The usual practice was to graze cattle in designated forest areas called khasmal and goucharan located in and around villages so that Reserved Forests were left untouched to provide other services to the community. However, with the passage of time and especially since the late 1970s and early 1980s the population of livestock saw a rapid increase concurrently with the increase of population of the State leading to rural graziers venturing into reserved forests as well in pursuit of greener pastures.

Rampant and widespread grazing in forest areas led to several deleterious impacts on

the forest ecosystem. The cattle herders who used to reside in cattle sheds or goths in the deep forests used to lop and fell trees and poles for their day to day use and for construction of their cattle sheds. This kind of indiscriminate lopping of trees around goths led to the creation of blanks in forest areas. Free ranging of cattle in forest areas resulted in soil compaction and the inability of trees to regenerate as new plants were often trampled upon and compaction of soil led to poor conditions for new saplings to sprout. Forest pathways leading in and out of goths also formed potential channels for rain water to run off the steep slopes causing soil erosion and reduced supply of water to the villages. New plantations raised in forests also do not survive due to over grazing.



to impose a ban on grazing and the order of ban continues to be in force

The effect of the ban is perceptible in the form of increased natural regeneration of forests and wildlife and improvement in water availability in nearby villages. Many rural water schemes which were failing due to drying up of water sources have been regenerated. The State prides itself for being part of a biodiversity hotspot. Prohibition

Due to these undesirable effects the Government took a decision to ban grazing in reserved forests and plantation areas in

1998. This step displayed a strong commitment to environmental conservation and resolute political will on the part of the Chief Minister as this was never done anywhere in the country. This measure would not have been popular as many people were engaged in this activity. As expected the cattle herders and their urbanbased owners moved the High Court of Sikkim against the Government. However, the Court ruled in favour of the Government's move

of grazing has also positively impacted biodiversity and ecosystem enrichment.





# **Participatory forest management**

Sikkim is in the forefront of local self governance in the country. It is indeed one of the first States to delegate powers to the grassroots level in the true spirit of Mahatma Gandhi's *village swaraj*. This emphasis on decentralized village level governance has touched forest and wildlife management as well. Forestry in India has undergone a transformation from extraction-based practices mainly to meet commercial interests to people-oriented action such as social forestry, in the last century. The National Forest Policy of 1988 also states that the first claim to a forest shall be the people dependent on it.

In line with this ideology, the State Government first brought out a notification for constitution of Joint Forest Management Committees (JFMCs) in 1998 with specific rules for sharing of usufruct and defining the role of these village-based committees in the management of their forests. JFMCs were conceived as democratic locallevel institutions which would, through a democratic process, take decisions on how forest produce is to be harvested and the benefits shared, how and where plantations and allied activities should be done and assist the forest department in forest protection measures. The action taken in 1998 was further consolidated in 2001 and 2002 when more detailed guidelines on constitution and operationalization of JFMCs were notified and JFMCs constituted all over the State to implement the policy of participatory forest management. JFMCs played a key role in protection and development of forest resources and development of degraded lands in and close to their villages. They were trained to undertake micro-planning at the village level using the participatory rural appraisal method. Based on these microplans forestry activities were planned and executed. The JFMCs have contributed immensely to forest protection by way of assisting the FEWMD in forest fire management and prevention, taking up expeditions for controlling illegal activities in forest areas and in checking encroachments. The department takes the help of these committees to identify needy villagers for various beneficiary oriented schemes and they decide what activities of village development are to be implemented as entry point activities of forestry schemes.

# Urban forestry -Rhododendron plantations

The Chief Minister directed the Forest, Environment & Wildlife Management Department to carry out beautification plantation of all urban spaces starting in all the four district headquarters in 2015. Accordingly, the green belt areas of Gangtok, Namchi and Pelling were taken up for plantation of rhododendron, azalea, hydrangea, pyracantha etc. The objective of this urban forestry work is to provide aesthetic value for the green spaces in important urban tourist places so that people can enjoy the scenic slopes within the cities and towns at the same time as the shopping arcades and markets.



# **State Green Mission**

#### A Unique Innovative Environment Programme Launched in Sikkim

The Government of Sikkim launched a unique and innovative programme called "State Green Mission" with a view to raise avenue plantations along the roads and beautification of all vacant and waste lands to further reinforce wide spread recognition of Sikkim being a Green State.

The State Government has taken initiative to generate avenue plantation in massive scale by using all the manpower in various departments in the Government, and other nature lovers from the Government and Non Governmental Organizations including different Eco clubs and Self Help groups. Accordingly, the Government issued a notification vide no 15/Home/06 dated 24/2/2006 in this regard. The Chief Minister Shri. Pawan Chamling formally launched this Mission on 27<sup>th</sup> February 2006 in the presence of all Ministers, officers and the public of Sikkim in the programme organized by the Forest, Environment and Wildlife Management department at Chintan Bhawan, Gangtok.

#### **Aims and Objectives**

The major objectives of the programme are to create green belt and avenues for meeting aesthetic recreational needs of the people and beautify the areas for tourist attraction. This programme is expected to provide fringe benefits like reduction in the surface run-off discharge and checking erosion in the downhill side and will also create a store house of genetic diversity by planting all the indigenous trees, shrubs, herbs, climbers, creepers, conifers and green foliages including fruits and medicinal plants.



Shri Pawan Chamling Chief Minister of Sikkim presenting Green School Trophy to Penlong Secondary School

The greenery generated out of this programme will also reduce noise pollution to the neighboring household population; attract the avifauna, butterflies, squirrels etc and their shelter. While transforming Sikkim into a Garden State, the mission will also work with the objective to promote tourism as a sustainable and eco friendly activity in the state of Sikkim. The programme is also expected to generate awareness on environment & forests and bringing in a sense of participation and ownership among people in the whole process.

#### **Implementing Mechanism**

A State level committee under the chairmanship of the Chief Minister was formed to oversee and to provide policy and administrative support to this mission. The Forest, Environment and Wildlife Management Department is the Nodal Department. At constituency level, there is Green Task force headed by the Area MLA to implement the programme in the Field. One District level officer is appointed as Nodal officer for each constituency. The Forest, Environment & Wildlife Management Department provides all technical, saplings and manure for the programme. All the Government departments provide managerial and labour force from the existing establishment. At ward level, one village protection committee is constituted headed by the concerned ward Panchayat member.

#### **Implementation period**

The programme was conceived by Shri Pawan Chamling Chief Minister as a symbol of the Government's resolve to convert Sikkim to a model "green" State with an overwhelming emphasis on environment friendly development. It was proposed to cover all of the state within three years right from 2006-07 to 2008-09 with a follow up programme every year subsequently. The State Green Mission has now completed its 11<sup>th</sup>phase of implementation and about 70-80% survival of plantation has been recorded as the main success indicator of the mission.

District	Phase I	Phase II	Phase III	Phase IV	Phase V	Phase VI	Phase VII	Phase VIII	Phase IX	Phase X
	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
East	2,65,625	2,11,357	73,885	5,56,518	1,52,824	3,98,397	63,530	1,23,210	79,180	77,376
West	1,58,389	2,74,577	1,48,019	1,19,411	1,11,900	11,340	45,400	27,756	34,535	38,567
North	33,000	3,40,008	2,19,497	96,032	75,456	8,044	8,386	51, 960	10,570	46,669
South	1,18,603	1,87,572	56,697	4,79,390	23,240	66,843	25,000	63,458	38,000	1,15,172
Year-wise	5,75,617	10,13,514	4,98,098	12,51,351	3,63,420	4,84,624	1,42,316	2,66,384	1,62,285	2,77,784
Total										

:

#### No. of seedlings planted from 2006-07 (Phase I) to 2015 -16 (Phase X)

Figure source: Territorial Circle, FE&WMD, GoS



Shri Pawan Chamling Chief Minister of Sikkim with school children after plantation programme

### **Species Recommended for State Green Mission**

#### Altitude : 2000' - 5500'

#### Trees:

Aesculus indica (Horse Chestnut), Cassia fistula (Amaltas), Cassia nodosa, Erythrina suberosa (Phaledo), Lagerstromia flos-reginae (Jarul), Emblica officinalis (Amala), Bauhinia sp. (Tanki), Alstonia scholaris (Chatiwan), Paulonia fortunii (Chinese teak), Paulonia elongate (Chinese teak), Tamarindus indicus (Imli, Thithri), Tree Ferns (Cyathea spp.), Callistemon (Bottle Brush), Jaccaranda mimosifolia (Jaccaranda), Syzygium cuminii (Jamun).

#### Shrubs:

Magnolia lilliflora (Magnolia), Cycas, Gaikhuray Fern, Datura sp., Tecoma stans, Hydrangea, Hibiscus (China rose), Euphorbia pulcherrima, Bougainvillea, Allamanda, Cestrum, Ixora stricta, Plumeria (Temple tree), Brunfelsia spp. (Yesterday, Today & Tomorrow Shrub), Saraca indica (Ashoka).

#### **Bulbous & Herbal Plants:**

Eucharis (Pyaji-Phool), Nerium, Zephyranthes robusta, Costus speciosus, Hemerocallis, Ophiopogon.

#### **Orchids:**

*Dendrobium* sp.(Auley Sunakhari), *Cymbidium longifolium* (Lekh Sunakhari).

#### Altitude : 5500' - 7000'

#### Trees:

Prunus cerasodes (Paiyu) October flowering, Prunus Gayzing Type March flowering, Cedrella toona (Tooni), Michelia excels (Rani Champ), Rhododendron arboreum (Laliguras), Symingtonia populnea (Pipli), Aesculus *indica, Paulonia fortunii* (Chinese teak), *Salix babylonica* (Weeping Willow, Bayas), Tree ferns.

#### Shrubs:

Mahonia napaulensis (Chutro), Hypericum sp., Hydrangea, Magnolia grandiflora (Gogey Champ), Luculia gratissima, Viburnum sp. (Asarey), Tibouchiana, Spiraea, Ardisia, Euphorbia pulcherrima (Lalupathi), Jasminum (Jasmine).

#### **Bulbs & Herbal Plants:**

*Agapanthus, Bergenia* sp.for walls, *Zephyranthus robusta, Hedychium species.* 

#### Orchids:

*Coelogyne cristata, Coelogyne nitida, Coelogyne ochracea* for walls and rocky area.

#### Altitude : 7000' - 10,000'

#### Trees:

Magnolia campbelli (Ghoghey champ), Acer sp. (Kapasi), Juniperus recurva (Juniper), Juniperus pseudosabina (Juniper), Larix griffithii (Larch Gobrey), Tsuga brunoniana (Salla), Populus ciliata (Poplar), Salix babylonica (Weeping Willow), Prunus sp.

#### Shrubs:

Hypericum sp., Rhododendron sp. (Gurans), Luculia gratissimum, Viburnum sp.(Asarey), Enkianthus campanulata, Rosa cannina, Hydrangea, Magnolia lilliflora, Pieris spp., Spiraea (April fool).

#### **Bulbous & Herbal Plants:**

Lupins, Bergenia, Arisaema sp., Hemerocallis, Cardiocrinum giganteum



Governor, Chief Minister and other dignitaries during ten minutes to earth programme

### Ten Minutes to Earth

Ten Minutes to Earth is a novel, unique and innovative programme conceptualized and initiated by the Chief Minister of Sikkim Shri. Pawan Chamling during 2009 in which the 25<sup>th</sup>day of June every year is observed by every citizen of the State as an annual ritual by dedicating ten minutes of their time in plantation, protection and conservation of Mother Earth.

During the first year of its implementation in 2009, a total of 6,10,694 saplings were planted in a stipulated 10 minutes time to beat the world record. As the clock ticked 10:30 thousands of people stopped all other



Shri Pawan Chamling Chief Minister dedicating ten minutes to mother earth



Shri Shrinivas Patil, Governor of Sikkim participating in ten minutes to earth









activities to pledge themselves to Mother Earth for 10 minutes. The people supported the program enthusiastically in all parts of the State to participate in the historic moments of planting saplings more than the population of State. The stipulated time was from 10:30 am to 10:40 am. The idea was to plant trees equivalent to the population of Sikkim in ten minutes: one tree for one person. This was also a record that within 10 minutes the plants numbering the population of the State were planted anywhere. This ten minutes activity would also help in sequestration of 1400 tons of carbon dioxide annually. So Sikkim has shown its unique way of climate change mitigation which contributes annually and would do forever during life of the planted trees.

Ten Minutes to Earth is an exceptional programme and is in the highest traditions of

the Indian civilization values. It is a people's programme where every person of Sikkim participates in planting on the same day and at the same time. Sikkim has successfully completed the 8<sup>th</sup> successive year of Ten Minutes to Earth programme with more than 15 lakh saplings planted through active participation of the nature loving people of the State. Through this programme, Sikkim has definitely ignited a lamp for restoration of ecology which would guide other States of India and the world towards the protection of the earth.

The state-wide massive plantation drive is coordinated by the Department of Forests, Environment & Wildlife Management, Government of Sikkim. The department provides free seedlings through distribution booths set up at every forest check post and several other prime locations throughout the State.

#### No. of seedlings planted during Ten Minutes to Earth Programme on 25th of June (2009 to 2015)

District	1 <sup>st</sup> Year	2 <sup>nd</sup> Year	3 <sup>rd</sup> Year	4 <sup>th</sup> Year	5 <sup>th</sup> Year	6 <sup>th</sup> Year	7 <sup>th</sup> Year
District	2009	2010	2011	2012	2013	2014	2015
East	2,03,740	1,85,000	64,277	54,255	54,115	50,110	46,169
West	1,86,039	1,15,586	21,895	17,305	10,775	6,721	4,416
North	60,465	54,104	9,224	7,541	14,105	2,009	10,094
South	1,60,450	1,17,341	18,472	8,232	5,365	6,000	18,340
Year-wise Total	6,10,694	4,72,031	1,13,868	87,333	84,360	64,840	79,019

Figure Source: Territorial Circle, FEWMD, GoS

# **Plant Conservatory at Bulbuley**

A plant conservatory meant for creating a gene pool of Rhododendrons found in Sikkim has been set up in Bulbuley. It also has a green house where orchids have been dis played along with other plants to showcase the biodiversity. The conservatory has been developed as an integrated tourism and recreation spot as well and will also have a central nature and culture interpretation center depicting the natural features of the State and cultural significance of the natural elements.



Shri Pawan Chamling, Chief Minister of Sikkim inaugurating the plant conservatory



Shri Shrinivas Patil, Governor of Sikkim visiting the plant conservatory



#### People's Programme of Afforestation

The Chief Minister Shri Pawan Chamling evolved the concept of Smritivan with a noble idea of planting trees in memory of near and dear ones. Smritivan is a mass voluntary effort to generate active involvement of the people in planting trees in the drive for Green Sikkim. The programme was launched by the Chief Minister, Shri Pawan Chamling on the occasion of World Environment Day i.e. 5th June, 1999 at Bulbuley Smritivan in East District which was followed in other districts. So far, 40 Smritivans have been created all over the state of which the main ones are at Bulbuley in East District, Tagore Smritivan at Rinchenpong, Sakyong Smritivan in West District. Guru Padmasambhawa Smritivan at

Tendong-Namchi, Rabongla Smritivan in South Sikkim and Yumthang Valley Smritivan in North Sikkim.

This programme has been taken to the doorstep of the people and every panchayat unit in the state has been motivated to create *Smritivan* in every village and revenue block.



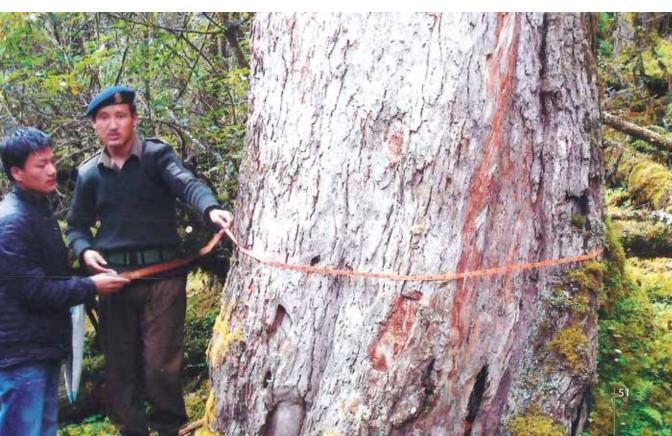


# **Heritage Trees**

Trees and forests have always been associated with the development of human civilizations whether in the sense of their exploitation to meet the economic needs of a country or region or to meet the basic needs of forest fringe villagers. In India trees have, since ages past, been traditionally worshipped in various forms for the benefits that they provide to the community. In 2009, the Chief Minister desired that the largest trees found in Sikkim's forests and outside forests should be identified and notified as heritage trees. The objective was to recognize the importance that such trees have had in the evolution of human settlements in the State. Such old growth trees have significant

historical and cultural value as they depict the generations of people who have seen them and made use of their fruits or other produce and left them for posterity. It becomes our bounden duty to safeguard such trees so that they continue to play a role in the lives of the present generation and also serve to inspire people towards conserving the natural elements that they are surrounded with and of which they are a part.

With these objectives in mind, the Forest, Environment & Wildlife Management Department identified trees in forest areas having girth above 25 feet in all the districts of Sikkim and notified them under the Sikkim Forest (Preservation, Protection



and Declaration) of Heritage Tree Rules, 2016 on June 4th, 2016. The Chief Minister released the notification of 21 heritage trees at the official World Environment Day function on 5th June 2016 at Mangan Senior Secondary School, North District. The Department is identifying trees above the girth of 20 feet in all parts of Sikkim to notify another set of trees in the second phase.



#### Chapter IV

# Environment Conservation, Awareness & Education

One of the goals under the Chief Minister's Forestry and Environment Mission is to achieve "100 % environment conscious citizens in Sikkim by 2020". This is a humungous task and children aged 6-16 have been identified as the predominant 'agents of change'. Moreover, various target groups including taxi drivers, government employees, school teachers and stakeholders have been identified as the predominant 'agents of change'. To attain this mission, the State Government under the visionary leadership of the Nation's Greenest Chief Minister, Shri Pawan Chamling, has been implementing various schemes across the State to create awareness amongst various target groups including taxi drivers, government employees, school teachers and general public at large.

#### **Green Industrial Revolution:**

Forest, Environment & Wildlife Management Department is the custodian of over 81% of the total geographical area of the State. The State that harbours tremendous natural resources could be easily exploited for vested economic interest. But, under the pro-environment policies of the State Government, Sikkim has realized that the natural resource base is finite and that it is imperative to use it judiciously so as to secure our future generations. The accelerating rate of environmental degradation accompanied by climate change concerns has led to the quest for sustainable development. The State Government in its quest for sustainable development revolutionized the State Industrial Policy with effect from 1<sup>st</sup> April, 1996 by promoting eco-friendly, pollution free and green industries through attractive incentives in the State of Sikkim. Prudently creating an atmosphere conducive for industrial growth, maintenance of the Green State image while promoting industrial activities has been the highly prioritized agenda for the development of Sikkim.

### Environmental Awareness Generation of School Children

#### Year 2000: Conceptualizing Eco-Club and Green Funds in Schools and Colleges. Year 2002: Compulsory Environment Education till Class VIII.

We all know that we are part of the environment we live in. And the solution to many environmental problems lie in our attitude towards environment. Be it awareness to keep our surroundings clean or the realization to conserve natural resources by re-using and recycling wherever possible, they all are attitudinal. On the surface it looks simple. But changing the attitudes of such huge populace is not going to happen overnight. The best way to attempt to bring about a change in the attitudes in society is through children. They have no vested interests. They are impressionable. They are our future. They are the single most important influence in any family. With this realization, the State Government conceptualized institution of Green Funds and Eco-Clubs in schools and colleges to empower the students and the young generations to be the agents of change for environment protection and its conservation.

Forest, Environment & Wildlife Management Department has been playing a key role in imparting environment awareness and education to school children and youths of the state through implementation of various schemes such as National Green Corps Eco-Club Programme, National Environment Awareness Campaign, Green School Programme, Paryavaran Mitra Programme, Earthian Schools Programme in coordination with the State Human Resource Development Department, Ministry of Environment, Forest & Climate Change, Government of India and NGOs of international repute such as Centre for Science and Environment (CSE), Centre for Environment Education (CEE) and Earthian WIPRO.

The primary objectives of the school ecoclub programmes are:

- To make children understand environment and environmental problems.
- To provide environmental education opportunities for school children.
- To utilize the unique position of school children as conduits for awareness of society at large.
- To facilitate children's participation in decision making in areas related to environment & development.
- To bring children into direct contact with the environmental problems facing the society they live in and make them think of solutions.
- To involve children in action based programmes related to environment in their surroundings.

Environmental Studies in primary stage were introduced in the year 2002-03 as EVS-I and EVS-II. EVS-I covers the social environment (History/Civics) where as EVS-II covers the physical environment (General Science). The Human Resource Development Department undertook a project on Environmental Education in School System (EESS) along with other 10 States in the year 2003. The project funded by World Bank through the Ministry of Environment and Forests has the following major components:

Development of Text Books in Science, Social Science and English for classes VI-VII. Printing and Development of Teacher support materials.

GLOBE Teachers Training Programme (100 Project Schools)

Stakeholders and Educational Administrators Orientation Programme on EESS (4 Districts).

Master Trainers Training Programme on EESS

Teacher Training (4 districts).

Under the development of Textbooks, a workshop on Greening of Textbooks was held from 27th- 29th Nov. 2003, where the review of textbooks and local specific components to be infused in the textbooks of classes VI -VIII in subjects Science, Social Science and English were identified under the guidance of Centre for Environment Education (CEE). These 'green' textbooks were printed by Frank and Bro. Co., New-Delhi, and these books were implemented from the academic session 2004 onwards. Under Global Learning and Observation to Benefit Environment (GLOBE), 98 schools were covered and one teacher from each school was trained for the measurement of certain parameters of the environment Stakeholders Orientation Programmes had been conducted in all the four districts. The basic aim of this programme was to make teachers, parents, NGOs and District Educational Administrators aware about the various components of the project and their implementation strategies. The programmes were held in April 2004. This programme was conducted from 19-22nd May 2004. Also a workshop was conducted on 23-24th May to develop framework for teacher handbook and other supplementary materials. Based on this frame work, a hand book was prepared and printed. The basic aim of this hand book

is to supplement classroom teaching. In the last phase of the project, about 400 teachers were trained regarding various methods of teaching environmental issues.

Now, with the support from Forest, Environment & Wildlife Management Department, all State Government schools have set up Eco-clubs and are taking keen interest and taking up various environment awareness related activities such as the following:

- Opening of a joint bank saving account for 'Green Fund' or 'Eco-Club Fund' in the name of school head and green teacher prefect for conducting environment awareness related activities in each school.
- Formation of 766 Eco-Club comprising 30-50 students and teachers to conduct quiz, debate and rallies among students to spread the message of environment related activities.
- Plantation in school compound each year on the eve of *World Environment Day*, *State Green Mission, Ten Minutes to Earth*.
- Auditing of school's natural resources under Green School Programme and certification for Green Schools by Centre for Science and Environment, New Delhi.
- Performing concrete action-based awareness drives like banner campaign, street shows, eco-paintings, eco-talk, creation and maintenance of herbal gardens and biodiversity parks, rain water harvesting, grey water treatment, development of kitchen garden, reusing and recycling school's waste, vermicomposting, practicing waste segregation at source, energy conservation and many more.

# Pokhari Sanrakshan Samiti



Another initiative of the Government towards environmental conservation is the constitution of Pokhari Sanrakshan Samitis (PSSs) or Lake Conservation Committees for those lakes which are important from the tourist point of view and which have the potential to be degraded as a result of tourism. PSSs have been successfully formed and are in operation for Tsangmo and Khecheodpalri lakes.

The Pokhari Sanrakshan Samitis have a general and executive bodies and they

collect lake conservation fees from tourist vehicles which are used for lake conservation activities. Members of the PSSs include local residents, taxi drivers, NGOs and the Forest, Environment & Wildlife Management Department is the coordinating agency. Activities carried out by these Samitis include clearing of the lake areas and its vicinity of garbage and littering, plantation, desiltation, awareness campaigns, bin and garbage bag distribution to taxis, construction of toilets, assistance to tourists etc.





Chief Minister Shri Pawan Chamling handing over the Green School Trophy to Hee Yangthang School

### **Green Awards**

- 1. Year 2000: Rajya Van Samrakshan Evam Paryavaran Puraskar
- 2. Year 2011: Chief Minister's Green School Rolling Trophy and State Level Green School Awards

In pro-people governance under the farsighted leadership of the Chief Minister Shri Pawan Chamling, people's forestry through involvement of Panchayats, Non-Government Organizations (NGOs) and other Public /Private enterprises has assumed immense significance. In order to promote socio-economic development in the State and to appreciate and encourage the efforts of panchayats, communities, individuals and NGOs who have made result oriented contribution to the development, conservation, protection and preservation of forests, wildlife and environment in Sikkim, the State Government instituted *Rajya Van Samrakshan Evam Paryavaran Puraskar* vide Sikkim Government Gazette Notification No. 158 dated 1st May, 2000.

The award is presented in the following categories;

- 1. Gram Panchayat Rs. 5000/- and Prasasti Patra
- Government Servant of any rank/ agency (Including Private Public Sector Agnecies) – Rs. 5000/- and Prasasti Patra
- Voluntary and Non Government Organization – Rs. 5000/- and Prasasti Patra

Sikkim State has the pride of being the first State in the country to launch and implement a prestigious award system.



Shri Pawan Chamling Chief Minister of Sikkim presenting Green School award to Hee-Yangthang Senior Secondary School

#### The Chief Minister's Green School Rolling Trophy and State Green Schools Award

These acknowledge the efforts of the school eco-clubs for their action towards environment protection and conservation. Chief Minister's Rolling Trophy in Sikkim is an award scheme to reward the best performing schools that have brought about positive change in the school's environment in terms of practices followed to improve the quality, usage, sustainability of land, air, water, energy and waste resources. The award scheme got impetus when the Chief Minister Shri Pawan Chamling during his address at Chintan Bhawan on the occasion of World Environment Day celebration on 5<sup>th</sup> of June, 2011 announced cash incentives of Rs 5.0 lakh to the best school. Rs. 1.0 lakh each for four other schools under Senior Secondary and Secondary categories. This award

scheme has now grown further to reward the efforts of Government Junior High Schools, Government Primary Schools and Private Schools from the State with cash reward of Rs. 50,000/- each. The awards are presented on the occasion of World Environment Day on 5<sup>th</sup> of June every year in a grand function.

#### Setting up of an Environmental Information System: *ENVIS Centre*

ENVIS, acronym for "Environment Information System", was set up in the Forest, Environment & Wildlife Management Department during the year 2002 with a mandate of collection, collation, storage in a retrieval system and dissemination of environmental related information to varying users, which include decision-makers, researchers, academicians, policy planners, research scientists, etc. ENVIS is now a distributed network of 69 centres across the country under the Ministry of Environment, Forest and Climate Change, Government of India and Sikkim ENVIS Centre under the Department of Forest, Environment & Wildlife Management was awarded as the BEST STATE CENTRE for 2014-15 by the Government of India.

Key achievements of ENVIS Centre:

- Development of CMS based ENVIS portal (<u>www.sikenvis.nic.in</u>)
- 2. Development of comprehensive State Forest web portal (<u>www.sikkimforest.</u> <u>gov.in</u>)
- Development of ISBEID (Indian Statelevel Basic Environmental Information Database) on 17 key environmental parameters.
- 4. Publication of 8 paged multicolor Quarterly Newsletters and a special edition 60 paged newsletters titled

"PANDA" with ISSN No. 2320-3943.

- 5. Preparation and Publication of State of Environment Reports.
- 6. Online query response system.
- 7. Regional Resource Agency and Nodal Agency for supporting school eco-club programme.
- Setting up of 766 school eco-clubs; Green Teacher's Training for more than 500 teachers; Certification of more than 100 schools of Sikkim as Green Schools of India.
- 9. Setting up of Library facility on environment, forestry, wildlife and biodiversity.
- Publication of knowledge products viz. Eco-Club Handbook, Environment Consciousness Study Report of Sikkim, Solid Waste Management at Source, Paryavaran Mahotsav pictorial reports, Nature's Marvel, etc.



# Paryavaran Mahotsav

A fortnightly environment festival (June 15 to June 30)

In order to keep up with the vision of developing Sikkim into a model green State, the Chief Minister of Sikkim, Shri Pawan Chamling declared **June 15-30** as **Paryavaran Mahotsav** fortnight in Sikkim. The declaration came during his public address on the occasion of launching 8<sup>th</sup> phase of State Green Mission on the 15<sup>th</sup> day of June, 2013 at the divine venue Tathagata Tsal, Ravangla in South Sikkim.

Paryavaran Mahotsav or the 'Environmental Festival' is a people's programme celebrated throughout the State from 15<sup>th</sup> to 30<sup>th</sup> June every year. Paryavaran Mahotsav has added vigor and dynamism to the green Sikkim campaign. It has set up a holistic platform duly integrating the state's flagship programmes viz. *State Green Mission* and



*Ten Minutes to Earth* which have now become the integral part of Paryavaran Mahotsav celebrated every year by the State Government.

During this fortnightly festival, various activities are carried out throughout the State:

- Flag off programme on 15th June every year; setting up of free seedling distribution booths, information booths.
- Mass plantation and sensitization drives as a part of State Green Mission.
- Ten Minutes to Earth plantation

drive on 25<sup>th</sup> of June from 10.30 am onwards every year.

- Greenathon (Green Run and Green Walk) for a clean and green Sikkim.
- Signature campaign, awareness programmes, lectures, talk shows through media, rally, banner campaign, street plays etc.
- Mass cleanliness drives of major towns and villages.
- Eco-paintings/ Essay Writing/ Debate/ Quiz competition at all school ecoclubs



# Important Key Environmental Initiatives at a Glance



- 1. 1997: Use of non-biodegradable materials like plastics, poly-bags, and biomedical / chemical wastes banned through legislation.
- 2. 2001: Sacred peaks, caves, rocks, lakes, '*chhorten*' & hot springs notified; scaling of important peaks

including Mt. Khangchendzonga (8598m) for mountaineering expeditions banned. Conservation of unique terrestrial & aquatic ecosystem of wetlands/lakes started by prohibiting commercial activities to preserve the heritage and fragile ecology of the State.

- **3. 2002:** Abandoned and closed Rathang Chhu HEP in West Sikkim and Firing Range 'G' in North.
- 4. 2005: Sikkim Ecology Fund and Environment Cess Act, 2005 framed. One of the very unique legislations providing for levy of cess on industries, traders and consumers for using non-biodegradable materials.
- 5. 2006: State Environment Agency constituted to coordinate and implement activities relating to environment awareness, education and information in the state.
- 6. 2007: National Bamboo Mission launched ;M.G Marg, Gangtok declared spit free zone; Sikkim became the first State in the country to constitute a high level team for the study of glaciers and alpine ecosystems.
- 7. 2008: Shri Pawan Chamling, Chief Minister of Sikkim participated in the Governor's Global Climate Summit at California on invitation of the California Governor, Mr. Arnold Schwarzenegger;
- 2008: Sikkim hosted the International Flower Festival at Saramsa Garden from 14<sup>th</sup> -16th March.
- **9. 2008**: Eco-Tourism Directorate created.
- **10. 2009:** Green School Programme (GSP) of Center for Science and Environment (A Delhi Based NGO) in co-ordination with the ENVIS center of the Department launched at the state

level in Sikkim in all schools, the first of its kind in the country.

- **11. 2009:** In order to protect and preserve the very old trees of Sikkim, a concept of identification and declaration of heritage trees was started with active participation of the local people.
- **12. 2009:** Climate Change Cell which will act as a one stop centre for all climate change related issues in the Department notified.
- **13. 2011:** Chief Minister's Green School Rolling Trophy and State-Level Green School Award constituted to reward the best performing schools (Top Five Schools) of the state in their environment endeavour.
- 14. 2013: As envisaged by the Chief Minister, Sikkim celebrated Paryavaran Mahotsav 2013 duly integrating the State's flagship programmes as conceived by the Chief Minister himself viz. State Green Mission and Ten Minutes to Earth by planting 3,50,744 number of saplings during June 15-30, 2013.
- 15. 2014: Paryavaran Mahotsav celebrated from 15 June to 30 June 2014 throughout the State for the second successive year undertaking the following main activities:9<sup>th</sup> successive phase of State Green Mission – 1,62,285 seedlings planted; 6<sup>th</sup> successive phase of Ten Minutes to Earth – 64,840 seedlings planted on 25<sup>th</sup> June 2014; Total 2,27,125 seedlings planted under Paryavaran Mahotsav 2014 campaign through active participation of all

government departments, several NGOs, municipal corporations, urban and rural bodies, private industries, educational institutes, panchayats and local people; Mass cleanliness drives conducted at major towns viz Gangtok, Pakyong, Rongli, Namchi, Jorethang, Ravangla, Geyzing, Soreng and Mangan; Greenathon (Green Run and Green Walk) for a clean and green Sikkim carried out in all districts at several locations for the first time.

- 16. 2014: The State Government through Gazette Notification No 544 dated 19<sup>th</sup> December 2014 imposed prohibition on the manufacture, sale and use or bursting of all types of firecracker including any sound emitting or illuminating type of firecrackers within the State of Sikkim
- **17. 2015:** The State Government through Gazette Notification No. 13 dated 27<sup>th</sup> January 2015 imposed prohibition on the burning of agricultural waste, leaves, litter, paper wastes and garbage within the State of Sikkim. The prohibition shall however, not cover the use of processed agricultural wastes, leaf litter and garbage as fuel and controlled burning of forest litter for the purpose of scientific management of forest fires.
- 18. 2015: International Conference to discuss, deliberate and have discourse on Conservation of Natural and Cultural values of Khangchendzonga National Park (proposed World Heritage site) was organized at Gangtok in presence of

renowned individuals both national and international in the field of biodiversity, culture and ecology.

- **19. 2015:** Sikkim State celebrated 3<sup>rd</sup> successive fifteen day (June 15-30) environment festival 'Paryavaran Mahotsav', a noble and unique initiative conceived by the Chief Minister Shri Pawan Chamling himself. This fifteen day festival witnessed the various events such as Greenathon (Green Run), environment lectures on low carbon life styles at various schools, cleanliness drives at major towns, awareness campaigns and State's flagship plantation programmes; 7th successive phase of Ten Minutes to Earth and 10th successive phase of State Green Mission with a total plantation of 3,56,803 seedlings throughout the State
- **20. 2015:** State Government through gazette notification no. 467 dated 18/12/2015 notified e-waste collection centre at Gangtok Municipal Corporation.
- **21. 2016:** Sikkim becomes the first state in the country to be declared as full-fledged Organic State. This historic declaration was made by the Hon'ble Prime Minister Shri Narendra Modi during Sustainable Agriculture Conference on January 18, 2016 at Gangtok.
- **22. 2016:** The Chief Minister of Sikkim Shri Pawan Chamling declared January 18<sup>th</sup> as the Organic Day in Sikkim.
- 23. 2016: Sikkim becomes the first Indian

State to ban mineral water bottles in government programmes. State Government through Notification No.25/Home/2016 dated 19/05/2016 has imposed ban on use of packaged drinking water bottles in any government functions and meetings to reduce the creation of garbage. Use of filtered water or large reusable water dispensers or reusable water bottles during government functions encouraged.

24. 2016: State Government through Notification No.26/Home/2016 dated

19/05/2016 has imposed ban on sale and use of disposable items such as cups, plates, containers etc made from Styrofoam throughout the State with immediate effect.

**25. 2016:** Recognizing the silvi cultural importance and ecosystem values of the historically significant trees found all over the state, State Government vide Notification No. 83/GoS/FEWMD/Pr.Secy-PCCF dated 04/06/2016 notified 21 number of trees under forest land as "Heritage Trees" of the state.



Shri G M Gurung Minister of SPWD Roads and Bridges receiving a sapling during Paryavaran Mahotsav, 2015

# **Ban on Plastic Carry Bags**

Use of non-biodegradable materials like plastic carry bags has been banned in the State of Sikkim since 1997.

Plastic bags are a convenient way to carry our purchased goods when we go shopping. They are a part of our modern lives, and we don't tend to think much about them. However, this convenience of plastic shopping bags carries with it a very high cost to the environment and also negatively affects human health. The following are a number of reasons why the State Government considered instituting ban on plastic bags:

- 1. **Plastic bags pollute our land and water.** Because they are so lightweight, plastic bags can travel long distances by wind and water. They litter our landscapes, get caught in fences and trees, float around in waterways eventually degrading our pristine eco-system.
- 2. Plastic bags are made from non-renewable resources and



**contribute to climate change.** The majority of plastic bags are made of polypropylene, a material that is made from petroleum and natural gas. Both of these materials are non-renewable fossil fuel-based resources and through



their extraction and production, they create greenhouse gases, which contribute to global climate change.

- 3. Plastic bags never break down. Petroleum-based plastic bags do not truly degrade. What does occur is that when out in the environment, the discarded plastic take years to break down or decompose eventually clogging our soil and effecting its health.
- 4. Plastic bags are harmful to wildlife and marine life. Plastic bags and their associated plastic pieces are often mistaken for food by animals, birds, and marine life like fish and sea turtles. The consumed plastic then

congests the digestive tracts of these animals, and can lead to health issues such as infections and even death by suffocation. Animals can also easily become entangled in this plastic.

5. Plastic bags are harmful to human health. Plastic fragments in the ocean such as those from plastic bags can absorb pollutants like PCBs (polychlorinated biphenyl) and PAHs (Polycyclic aromatic hydrocarbons), which are known to be hormonedisrupting chemicals. When marine organisms consume plastics in our oceans, these chemicals can make their way through the ocean's food web and then into humans who eat fish and other marine organisms.

# **Ban on Firecrackers**

The State Government through Gazette Notification No 544 dated 19<sup>th</sup> December 2014 imposed prohibition on the manufacture, sale and use or bursting of all types of firecracker including any sound emitting or illuminating type of firecrackers within the State of Sikkim.

Rampant use of firecrackers during the festivals and other occasion has led to several implications in the ecological fragile Himalayan State that harbors more than 25% of country's biodiversity. As Sikkim falls in one of the only two biodiversity hotspots of the country, every measure possible taken by the State Government to conserve this biodiversity has been welcomed by the people of Sikkim.

Besides all possible health and other hazardous impacts, the noise and air pollutants from firecrackers are irksome for both human and animals especially avifauna.



The sparkles, powerful sounds, flashy lights and colors from fireworks might excite a human mind, but there are many tiny beautiful creatures and other living beings that share this wonderful planet and they need some privacy and peace too. Most of the animals and birds get scared and they panic as they do not know what exactly is happening around them. It is not joy but shock that fills their innocent minds. When they hear such booming noise from those crackers they tremble with fear and run helter-skelter!



# Ban on Burning of Agricultural Waste

The State Government through Gazette Notification No. 13 dated 27<sup>th</sup> January 2015 imposed prohibition on the burning of agricultural waste, leaves, litter, paper wastes and garbage within the State of Sikkim. The prohibition shall however, not cover the use of processed agricultural wastes, leaf litter and garbage as fuel and controlled burning of forest litter for the purpose of scientific management of forest fires.

Burning of agricultural wastes (old dry stems of rice, maize etc. after harvesting of crop), dry leaves, paper etc. is an environmentally unsound activity as all this leads to air pollution and adds to global warming.

There are other adverse effects which are described as follows:

 Burning of agricultural wastes, dry leaves, paper etc. is not good for the environment as it produces gases such as carbon di oxide which escape into the atmosphere. Such gases remain hanging a few hundreds of feet above the earth's surface for a long time and trap the heat of the sun making the earth hot. Heating of the earth leads to less rainfall and drying of crops adversely affecting agricultural production. If we don't burn dry leaves, papers etc. then these gases are not trapped in the upper part of the atmosphere and the sun's rays are reflected back and so does not lead to heating of the earth.

- 2. When we burn dry leaves, paper, agriculture wastes etc. in our agricultural fields or in other open areas then the smoke produced contains many gases which cause pollution of the air that we breathe. Pollution of the air by smoke leads to breathing problem and for people who have diseases like asthma, cold and cough smoke will make the disease worse.
- 3. Another advantage of ban on burning of leaves, agriculture wastes etc. is that these leaves, agricultural wastes etc. will remain in the soil and add organic manure to it if it is left there to decay. This means that the soil will become more fertile and give good harvest in the future.

# **Ban on Styrofoam Products**

The State Government through Notification No.26/Home/2016 dated 19/05/2016 has imposed a ban on sale and use of disposable items such as cups, plates, spoons, containers etc made from Styrofoam throughout the State with immediate effect.

Disposable Styrofoam or Thermocol products like plates, cups and food containers are non-biodegradable and non-recyclable. Styrofoam and Thermocol are trade names of a type of plastic called polystyrene, a white, lightweight material, which takes hundreds of years to break down. Polystyrene has been linked to cancer. A March 2010 report of the Union Ministry of Environment, Forests and Climate Change noted polystyrene's ill-effects and warned that it was unsafe for food and beverage packaging as polystyrene breaks down to styrene at low temperatures. Many reports globally have classified styrene as a possible human carcinogen. Styrene also enters human bodies through the food chain. The disposable food ware that we toss out after a quick meal, mostly makes its way to the nearest water body from where it eventually flows into the oceans. It is estimated that 90% of floating marine debris comprises plastic, including polystyrene. Once in the oceans, the polystyrene degrades in the presence of sunlight and breaks down into smaller pieces that marine animals mistake for food, ingest and die. Several scientific studies have found small plastic debris, including polystyrene foam, inside the bodies of marine species, fish and seabirds. These marine creatures eventually make their way to our plates.

## Prohibition of packaged drinking water bottles in government functions and meetings

Sikkim becomes the first Indian State to ban mineral water bottles in government programmes. State Government through Notification No.25/Home/2016 dated 19/05/2016 has imposed a ban on use of packaged drinking water bottles in any government functions and meetings to reduce the creation of garbage. Use of filtered water or large reusable water dispensers or reusable water bottles during government functions encouraged.

Discarded packaged water bottles, clog waterways and fast fill up landfills out of which toxins leach, contaminating water in and around the area, posing a health hazard for people and a serious challenge for limited landfill.

### Chapter V

## Wildlife & Other Biodiversity

### A: Wildlife & Biodiversity Research:

Wildlife and other biodiversity exploration in Sikkim started with Sir Joseph Dalton Hooker's pioneering botanical and biogeographical explorations between 1847 and 1850 with the resulting output, a naturalist's tome, the Himalayan Journals published in 1891. Spurred by his enthralling narrative, in the next 40 odd years, a number of British botanists traversed most of the state using indigenous Lepcha collectors. Not only were plant collections deposited at the Central National Herbarium, Kolkata, but seeds of wild plants were sent out to botanic gardens throughout the world as were bird, butterfly and other insect specimens among others; scores of books, periodicals, research





Red Lacewing Cethosia biblis

papers in journals were also published. H. H. Risley's Gazetteer of Sikkim is a case in point, documenting almost all aspects of life in Sikkim including its enormous biodiversity. In short, as botanists Smith and Cave remark in their book on vegetation of Zemu and Lhonak valleys of Sikkim, '... The result is that probably no corresponding area in India has been so fully ransacked for its flora and probably none is so well known, despite the wealth and variety of its vegetation due to the great range of altitude and of humidity.'

Father of Modern Forestry in Sikkim, Chogyal Sidkeong Tulku in power from 1909-1914, had spent some time at Oxford with the assistance of the then Political Officer Claude White before he took over the reins of Sikkim. The sweeping and farsighted reforms he brought into the system saw the birth and flowering of the Forest



Indian Redl Admirals on Berginia ciliata

Department, with the result that despite ongoing development initiatives, Sikkim a 100 years later, today still has one of the best forest and wildlife protected area coverage in the country.

Following Chogyal Sidkeong Tulku's scientific re-organization of the Forest Department, delineating Reserve Forests (for forest and wildlife protection), Gaucharan or Gorucharan (for livestock grazing) and Khasmal (for fuelwood and fodder), protecting green belts along watercourses and taking other pioneering environmentally friendly initiatives, it became easier for the Forest Managers to take their charge seriously and confidently. Once Sikkim became part of India, there were series of major and minor explorations and collecting expeditions by Zoological Survey of India (ZSI) and Botanical Survey of India (BSI) resulting in



First record of MISHMI TAKIN Budorcas taxicolor in Sikkim



Shri Pawan Chamling, Chief Minister releasing poster on green cities during World Environment Day 2005

several publications such as the five-Volume Fauna of Sikkim by ZSI.

In the last two decades 1995-2016, following upon the Green Initiatives of the government led by Shri Pawan Chamling Chief Minister of Sikkim, we have documentation of not only the flora and fauna but also the diversity of micro-organisms, domesticated biodiversity and introduced, naturalized exotic species. From mere documentation we have graduated from survey-collection to more management oriented outputs involving use of sophisticated instruments like GIS, GPS, camera traps, mist-nets and increment borers, in one of the most challenging places in the Himalayas, Sikkim.

Wildlife conservation has worldwide significance. In this field, within this period

of two decades, Sikkim State has progressed a great deal with the final notifications of all Wildlife Protected Areas (WLPAs) of Sikkim including India's highest altitude National Park i.e. Khangchendzonga National Park, recognized as a World Heritage Site by UNESCO on 17 July 2016, a Biosphere Reserve known as Khangchendzonga Biosphere Reserve and seven Wildlife





Sanctuaries all occupying as much as 42.54% of State's total geographical area under the WLPA network including Biosphere Reserve. This has given Sikkim the unique distinction of the highest coverage under WLPA network in the country.

In addition in 2003, the Government recognized eleven (11) IBAs or Important Bird and Biodiversity Areas across the state, covering the priority sites for conservation efforts, a first of its kind initiative. This has encouraged eco-friendly tourism initiatives. The State has been able to set aside 51.68 % of the State's forest land area under the WLPA network including Biosphere Reserve for the protection and conservation of State's rich wildlife and biodiversity resources.

Protection, preservation and conservation is achieved through the people's participation represented by Eco-Development Committees (EDCs) formed around the protected areas. The EDCs are the local village bodies and partners with the wildlife managers for the protection, preservation and propagation of wildlife in the National Park and Wildlife Sanctuaries. 57 EDCs around the protected areas are implementing Wildlife Forest Development Agency schemes since the year 2004.

# Wildlife Protected Areas commissioned and declared since the year 1995-96 are as below:

SI. No.	Name of Wildlife Protected Area	Location District	Area	Date of Initial Declaration/ Notification	Date of final Notification of the WPA after determining rights & privileges
1	Khangchendzonga National Park (WORLD HERITAGE SITE 17 July 2016)	North & West	1784 Sq. Kms (expanded from 850 sq.km)	Not. No. 43(9)- Home/77 dated 26-08-1977.	Not. No. 1/KNP(WL) /F/27 dated 19-05-1997
2	Khangchendzonga Biosphere Reserve	North, South & West	2931.12 Sq. Kms (expanded due to addition of Transition Zone)	MoEF, GOI, Letter No. J-22016/76/91-BR dated 07-02-2000	Not. No. 204/KNPKBR/WL/ Forest/2009 dated 24-05- 2010
3	Shingba Rhododendron Sanctuary	North	43 Sq.kms	Not. No. 46/ WL/F/92/1585/ FMWL dated 05- 12-1992	Not. No. 45/WL/F/83 dated 25-01-1999
4	Pangolakha WLS	East	128 Sq.kms	Not. No. 26/ WL/F/89 dated 07-11-2000	Not. No. 10/9/WCL/02/127 dated 05-09-2002
5	Kyongnosla Alpine Sanctuary	East	31 Sq.kms	Not. No. 45/ WL/F/92/1585/ FMWL dated 05- 12-1992	Not. No. 45/WL/F/83/05 dated 25-01-1999
6	Fambonglho WLS	East	51.76 - Sq.kms	Not. No. 34/WL/82 dated 02-04-1984	
7	Kitam Bird Sanctuary	South	6 Sq.kms	Not. No. 39/ FEWL/2005 dated 03-02-2005	Not. No. 37/FEWL dated 17-06-2006
8	Maenam WLS	South	35.34 Sq.kms	Not. No. 63/ WL/F/86 dated 19-03-1987	Not. No. 45/WL/F/83/04 dated 25-01-1999
9	Sling Dong Fairrieanum Orchid Conservation Reserve	South	0.06 sq.kms		Not. No. 24/CWLW/GOS/ FEWMD/308/WLC/08 dated 05-11-2008
10	Barsey WLS	West	104 Sq. kms		Not. No. 50/WL/F/9 dated 08-07-1996

Now in the last two decades, most of the WLPAs were finally notified and extension of their areas depicted in at page 77.

The Department of Forest, Environment & Wildlife Management in the state adopting been has and implementing following strategies for smooth and effective management of Protected Areas i.e. Sanctuaries and National Parks which are oriented towards protection, conservation and preservation of pristine flora and unique Himalayan fauna in the state:

(i) Strengthening and Enhancing the Protected Areas Network

*(ii) Effective Management of Protected Areas* 

*(iii) Conservation of Wildlife and Endangered Species and their Habitats* 

*(iv) Restoration of Degraded habitats outside Protected Areas* 

(v) Control of Poaching and Illegal Trade in Wild Animal and Plant Species

(vi) Monitoring and Research

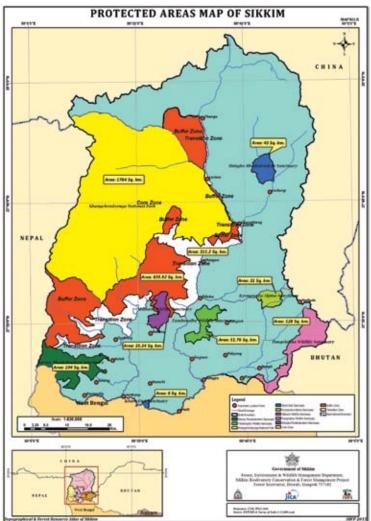
(vii) Human Resource Development and Personnel Planning

(viii) Ensuring Peoples' Support & Participation in Wildlife Conservations

*(ix)* Conservation Education and Protected Area Interpretation

(x) Tourism in Protected Areas

(xi) Domestic Legislation and International Conventions



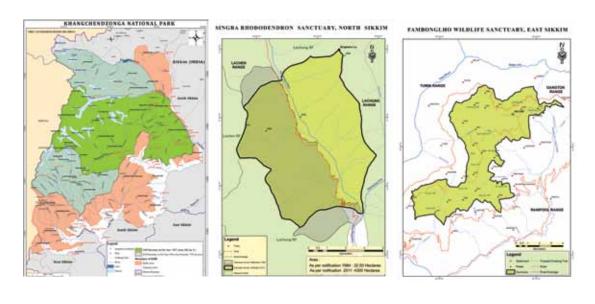
(xii) Enhancing Financial Allocations for Ensuring Sustained Fund Flow to the Wildlife Sector

(xiii) Integration of National Wildlife Action Plan with Other Sect oral Programmes

(xiv) Management plan of PAs

(xv) Human and animal conflicts

(xvi) Other initiatives:



KITAM BIRD SANCTUARY, SOUTH SIKKIM

PANGOLAKHA WILDLIFE SANCTUARY, EAST SIKKIM





- *a.* Sidkeong Tulku Bird Park at Rabdentse, West Sikkim covering an area of 18.85 Hectares
- **b.** Butterfly Park at Rangrang, North Sikkim covering an area of 26.5 Hectares
- c. Critical Wildlife Habitats: identified inviolate areas within the Wildlife Protected Areas and declared as Critical Wildlife Habitats which need to be validated by scientifically backed investigations with strong logistic and financial resources from the Ministry, Government of India

## Some Significant Contributions in Wildlife & Biodiversity Conservation: 1995-2016

- 1. High altitude biodiversity field surveys in Sikkim including
  - a. Asian Waterfowl Count for migratory waterfowl; Bird Ringing;
  - b. Alpine Grassland Ecology project in trans-Himalayan Sikkim, for conserving globally threatened species (Black-necked Crane *Grus nigricollis*, Tibetan Argali *Ovis ammon*, Southern Kiang *Equus kiang*) and efforts to save high altitude glacial lakes like Gurudongmar Tso and Gyam Tsona.
- 2. Lowland & Middle-altitude forest Surveys for
  - a. Endangered Bird Area (EBA) species such as Rufous-necked Hornbill *Aceros nipalensis*, Ward's Trogon *Harpactes wardi*, Honeyguide *Indicator xanthonotus*.
  - b. Pilot survey of Red Panda *Ailurus fulgens* (State Animal) in feasible habitats within and outside protected areas
  - c. Books on *Biodiversity of Raj Bhavan*; 'Important Bird Areas of Sikkim: Priority Sites for Conservation' (in collaboration with BNHS, RSBP, BirdLife International, Indian Bird Conservation Network and Sikkim Ornithological Society); Sikkim chapter in Proposed Ramsar Sites of Sikkim'' published by BNHS; Book

Chapters: Biodiversity of Sikkim; Butterfly Poster/Calendars, Brochures on *Centenary of Forest Dept* and Birds of Rabdentse Bird Park; Sikkim Biodiversity Strategy and Action Plan (SBSAP) published and released by the Government of Sikkim, Plan for Conservation and Sustainable Use of Medicinal Plants of Sikkim (CSUMPS)-2003

- Experimental Butterfly Breeding project with two larval foodplant nurseries (LFPs) and two experimental breeding cages for propagation of endangered species of Papilionid butterflies at Saramsa and Middle Camp, East Sikkim
- 4. Extensive Awareness programmes on Wildlife/biodiversity and capacity building/skill development programmes for schools, army, mountaineering institute, tourist guides, Government depts. and general public throughout Sikkim; including radio-talks, newspaper articles; Coordination with AH/Army for Control of Wildlife Disease (FMD, AI); Biodiversity Crime Control along Nathula Trade Route; Project Snow Leopard activities with local NGO TMI-India; successfully stopped snakecharmers in Sikkim with help of Police dept.
- 5. International GenBank Accession nos. (GenBank EF554684-EF554688) for

wild ungulates threatened globally with extinction Ovis ammon hodgsoni and Procapra picticaudata in Aug 2007

- Awareness about need for reintroduction of high altitude Livestock Guardian Dog Tibetan Mastiff, the most ancient breed of dog known to man and lost from Sikkim due to anthropogenic activities in trans-Himalayan habitat, helped AHLF&VS Dept. for breeding initiatives.
- Facilitated and assisted local and national/international environmental NGOs (Green Circle, Sikkim Ornithological Society); CEE, WWF, WPA, BNHS, VetsBeyondBorders (SARAH - Sikkim Anti Rabies and Animal Health Programme) in environment and biodiversity related issues including under NEAC programme
- Ban on Veterinary use of NSAID Diclofenac (Sikkim 1<sup>st</sup> State in country to ban the drug by notification) Vulture population, birds valuable to mankind for their scavenging services, ridding the country sides of decay and disease, but whose population across the subcontinent has crashed, making it a Critically Threatened species.
- Monitoring information and awareness of Avian Influenza or Bird-flu issues in Sikkim
- Government recognition of eleven (11) Important Bird Areas in Sikkim: Priority Sites for Conservation and publication of book
- 11. Dossiers for three Wetlands Complexes (Tsomgo-Bedang Tso, Khacheodpalri-Khangchendzonga-Lhonak, and Tso Lhamo plateau-Lashar-Yumesamdong-

Tambao Wetland Complexes) Submitted to Ministry of Environment and Forest for consideration in the Ramsar "List of Wetlands of International Importance" as RAMSAR SITES

- Maintaining Heritage State Forest Herbarium housing botanical collection dating back to 1933
- 13. In line with the national Wildlife (Protection) Act 1972 in force in Sikkim since 1975, the State Government instituted the ban on hunting and killing of wildlife in Sikkim successfully since last two decades.
- Initiated unique forest and culture related eco-tourism ventures such as Banavas Project in Barsey Rhododendron Sanctuary, Chauridara Green Village concept at the base of Maenam Wildlife Sanctuary

### Sikkim Forest Centenary 2009:

Department celebrated its Centenary on 2009 when a Centenary Souvenir was compiled with contributions in various forms: informative articles of times spent in forest service by senior officials who have since retired, by in-service officials who have much to share about work ethics during their field lives in the past decades, dedication to the



cause of forestry and conservation, by junior field staff and other field functionaries, old and new photographs, even poems inspired by their time in Sikkim's verdant landscapes. All these were inspiring for this generation's foresters who now have a clue about working conditions, dedication, commitments, joys and sorrows at a time when there was no 'high-tech' instrumentation involved, arduous distances had to be covered on foot and adventurous life-threatening situations in snowy mountains undocumented in photographs.

In the terminal decade and a half years of the Centenary, Sikkim has witnessed a paradigm shift in policy, planning and implementation of Forest. Wildlife and Environment protection and management practices from one of custodial policing of the resource to a people's programme in owning, augmenting and safeguarding it. In doing so, we have achieved significant milestones manifesting itself in impressive increase in forest cover by over 2% over the decade, and introduction of established and more innovative practices of nature conservation. These include ban on grazing the forest floor, the Harit Kranti Dashak, propagation and implementation of the concept of Smriti Vans, the Green Decade and the State Green Mission and our unique 10 Minutes to Earth program. I feel, some of the pioneering initiatives that our Government has contributed to the making of forests are ideal for protection of Himalayan eco-system.

Forests are the anchor sheet of our survival. They serve us in multifarious ways to ensure that mankind enjoys a healthy, harmonious and holistic living on this Mother Earth. Regrettably much of the forest cover in the world has disappeared leading to imbalance in climate and environment. While we observe the Centenary Celebration, we will have to increasingly disseminate Sikkim's successful experience Nature Conservation measures that we have adopted over the decades.

### International Rhododendron Festival 2010:

The International Rhododendron Festival 2010, the first of its kind in the entire Himalayas, was celebrated in April -May 2010 at the Shingba Rhododendron Sanctuary, North Sikkim. Inaugurated by His Excellency Governor of West Bengal, holding additional charge of Sikkim Governor, Shri M. K. Narayanan at the picturesque Sanctuary in the high altitude snow clad district. Sikkim is a treasure trove of Rhododendrons of the nation with at least 36 species of Rhododendron (Greek term which means the Rose Tree) comprising around 72 % of the country's Rhododendron species which are the glory of the Sikkim Himalavas.

The year-long event was visualized and initiated with an aim to increase tourism footfalls in this rich natural resource area and also aimed at generating awareness and promoting the conservation of Sikkim's rich heritage of Rhododendrons at a global level.





## Himalayan Zoological Park (HZP), Bulbuley, Gangtok

Once the grazing ground for livestock of Gangtok, the Himalayan Zoological Park was formally opened to the public in 1997, with the aim to promote wildlife conservation, conservation breeding of endangered species and public awareness. Despite its sheer vastness of 230 Ha, it is classified as a "Small Zoo" by the Central Zoo Authority of India. The HZP today houses 19 species of birds and mammals manned by 21 dedicated zoo keepers.

Until early nineties, the State Forest Department managed a small Deer Park in the Tashiling Secretariat premises at Gangtok. It was named Rustomji Deer Park after Shri N. Rustomji who was an important personality during the then monarchical system of government in Sikkim. The Deer Park was primarily created to display Deer species such as Sambar, Spotted Deer, and Barking Deer. Later on, a few rescued wild animals such as Black Bear, Red Panda, Brahminy Shelduck and high altitude Pheasants were also housed there. An area of about 230 hectare was selected for the establishment of Himalayan Zoological Park. Shifting of the animals from Rustomji Deer Park, Tashiling to the Himalayan Zoological Park was completed by 1995.

Most enclosures within the Himalayan Zoological Park are based on an "Immersion Exhibit" concept which allows the animals as well as visitors to be immersed within the animal's natural habitat without creation of additional artificial structures, save barriers. All enclosures are kept as naturalistic as possible by simply creating enclosed spaces around existing landscapes allowing animals to encounter varied land formations as they would naturally do in the wild. Since 1995 several new enclosures have been added such as for the leopards, ungulates and pheasantry with the assistance of the Government.

The Himalayan Zoological Park plays an important role in the Conservation Breeding of Endangered Species program. The park is an active participating zoo in the Red Panda Conservation Breeding Program and has been earmarked as Coordinating Zoo for Blue Sheep, Himalayan Tahr and Blood Pheasant. Owing to the already naturalized enclosures and endeavors to create a space with minimal human disturbance, the department has achieved tremendous success in breeding Red Panda and Blue Sheep already. The Goral exhibit also possesses an excellent stock of breeding animals. Red Panda breeding for the year 2016 has also been held back owing to a lack of sufficient space.







#### Functions & Objectives:

- To improve the infrastructure of the Animal Enclosures.
- To provide essential supporting equipments / instruments for the animals.
- To improve the behavioral enrichment of the animals.
- Qualitative feeds to the captive animals.
- Animal health and numerical strength through captive breeding.
- Conservation of endangered species of Himalayan fauna.
- To educate the students and public about importance of wild animals and need for conservation.

A **rescue centre** is an integral part of any zoo. It is necessary to provide a place for safe keeping of wild life that is rescued from outside their habitat when they stray out and become subject to human wildlife conflict or else need to be translocated to the safety of a zoo. Sometimes animals rescued from human habitations are also carriers of vectors and bacteria, therefore it is imperative and scientifically appropriate to keep them in quarantine for some time



before rehabilitating them into the wild or making them a part of the zoo display. In Sikkim, with several cases of human-wildlife conflict coming to the fore in recent years, a deficiency of an appropriate rescue centre was felt. It was proposed to construct a rescue centre under the JICA-assisted Sikkim Biodiversity and Forest Management Project. Necessary action is underway to construct this much needed facility in the Himalayan Zoological Park.

#### **Conservation Breeding programs:**

In these programs, it is essential that the animals are subject to minimal stress. The relation between the zoo keepers and the animals is such that animals are accustomed to their keepers' movements in and around the enclosure while the keepers also respect the animal's need for space and privacy. Animals are not handled unless required for veterinary examination, or routine zoo procedures. This level of trust and confidence between the animals and their keepers facilitates a stress free environment for monitoring animal movement and breeding activities. Till date the HZP has successfully bred Red Panda, Blue Sheep, even Grey Peacock Pheasant

Breeding in captivity is an achievement which supports conservation both in ex-situ and in-situ condition. Surplus and fit species can be released in the wild to support the dwindling wild species. These are some of the good aspects and roles of zoos they play to justify their being. The following animals are breeding successfully in HZP:

Sl. No.	Name of Species	Births during 2015
1.	Red Panda	03
2.	Blue Sheep	01
3.	Brown Goral	02
4.	Leopard-Cat	01
5.	Barking Deer	01
6.	Kalij Pheasant	01
7.	Grey Peacock	01

#### **Red Panda Conservation Breeding Program RPCBP:**

The HZP takes measures to ensure that all individuals in the Red Panda breeding program are genetically pure. The park has a separate designated space, out of bounds for visitors, for Breeding Red Pandas. As the area is isolated and relatively undisturbed, it has seen the birth of several cubs from 1999, all raised by their parents in as wild a state as possible. The HZP is the Participating Zoo in India to the Red Panda Conservation Breeding Program, with its coordinating Zoo at the Padmaja Naidu Himalayan Zoological Park in Darjeeling, West Bengal. With the first breeding pair of individuals Preeti (female, from Rotterdam Zoo, Netherlands) and Jugal (male, from PNHZP, Darjeeling) brought to the HZP in 1997, the park has to date, housed a total of 34 Red Panda over the years, documented in the International Stud





Book Records. Today, in addition to Simon the last descendant of the founder breeding pair of Preeti and Jugal, the HZP houses 4 Red Panda of wild origin, and 7 captive bred individuals. The Park's location and favorable climatic and vegetation conditions. as well as endeavor to ensure that all enclosures mimic the naturalistic conditions of the wild, has ensured a healthy breeding record for the HZP on a yearly basis. This year the RPCBP at the HZP witnessed the births of three cubs, born to females, all of wild origin. The HZP so far has managed to maintain strict a pedigree with all breeding pairings remaining entirely unrelated, and documented in Red Panda Pedigree Chart.

The Red Panda Conservation Breeding Program is one essential to the survival of the Red Panda in the state of Sikkim, where growing urbanization of the land is inevitable. The viability and sustainability of the RPCBP depends a lot on the support given to it not only in terms of financial assistance without which running such a program is not possible considering the demands of the project, but also awareness among the people of the impact of the species on the overall ecosystem of the area. With the current record of the program's breeding success it is evident that the RPCBP HZP is an integral part of the overall conservation program. If more efforts are made to expand the program in terms of research, international animal exchanges, re-introduction and species advocacy, the RPCBP will undoubtedly make waves in the conservation of this vulnerable species and subsequently the surrounding ecosystem.

### Animal exchange program with Darjeeling Zoo:

The HZP has a tie up with the Darjeeling zoo for the exchange of animals which was initiated in the early 2000s. Under the program Snow Leopard, Red Panda, ungulates like Himalayan Tahr, Blue Sheep, etc. have been exchanged between the two zoos.

### Important Programmes Under the Forests, Environment and Wildlife Department



Eco Hut in Fambhang Lho Wildlife Sanctuary

1. Development of Eco tourism at Golitar, Fambonglho Wildlife Sanctuary, East Sikkim (NEC):

> Development of Eco-Tourism at Golitar in Fambonglho Wildlife Sanctuary, a project to develop the area as the best eco-tourism destination near the State capital has been initiated by the East Wildlife Division, Forests, Env. & Wildlife Management Department.

Nature Interpretation Centre-cum-Office, NIC-cum-Reception Centre,



Footpath surrounding lake in Fambhang Lho Wildlife Sanctuary

Eco-Huts, Forest Guard Barrack, viewing deck, cafeteria, Gazebo, traditional entry gate etc. are included in the project.

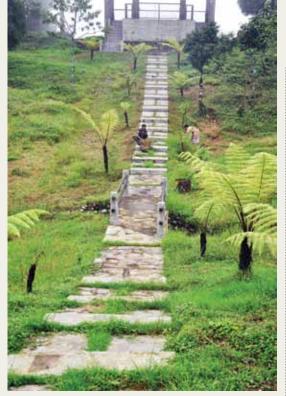
- The Project is sanctioned by the North Eastern Council (NEC) Secretariat, Shillong under the Ministry of Development of North Eastern Region, Government of India.
- Cost of project ₹ 394.63 lakhs (Rupees three crore ninety four lakhs sixty three thousand) only.
- 2. Creation of Banbas Project in Barsey Rhododendron Sanctuary at Hee-Bermoik (NEC)

### **Objective of the Project**

To promote sustainable eco-tourism for overall development of the local community with a better understanding and appreciation of natural and cultural values. The project is also aimed at



Lake Development in Fambhang Lho Wildlife Sanctuary

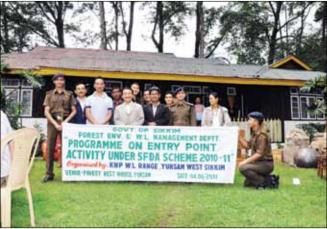


providing a unique close-to-nature based eco-tourism that involves education and interpretation of the natural environment to the people in general.

### Details

- The Project is sanctioned by the North Eastern Council (NEC) Secretariat, Shillong under the Ministry of Development of North Eastern Region, Government of India.
- Cost of the project Rs. 280 lakhs (Rupees two crores eighty lakhs) only on the sharing basis of 90:10 between the North Eastern Council and the State Government respectively.
- 3. Development of Eco tourism & allied activities at Chauridara, Green Village, South Sikkim (NEC)

Chauridara, a small village falls in South District in the State of Sikkim. It is situated in the Payong Kau Gram Panchayat Unit under 16 Tumin Lingi Constituency and on the base of the Maenam Wildlife Sanctuary with Bhalley-dhunga at the top and crowned by the religious Maenam Gumpa. The Village is bordered by Simana Khola in the south. Sukwa Khola in the west. Dhamala dara in the east and Maenam Wildlife Sanctuary in the North. It is a small village with just 62 households including the part of Darakharka village with the population of 357 numbers. The village is mostly dominated by a community of Most Backward Classes (MBCs) with majority of numbers of Rai community. Substantial population is also represented by people of



Distribution of community assets.

Other Backward Classes (OBC) and small number being represented by Scheduled Tribes. With this background, the people of Chauridara Village have proposed for declaration



of this village as 'Green Village' and the same has been agreed by the Chief Minister, Government of Sikkim in his village to village tour in 2009. Chief Minister with the opinion of the local people have suggested for development of infrastructures in a very eco-friendly approach and with green concept. It should also be supported by homestay facilities in the village itself. This would in turn give them a sustainable livelihood through eco-tourism and reduce their dependence on forests. They have agreed to prevent hunting of wild animals and felling of trees in their area and have resolved for conservation of the environment and nature. They have proposed to go for organic agricultural and horticultural practice and use of eco-friendly utilities.

#### Objective

- 1. To provide eco tourism related inputs at Chauridara, South Sikkim.
- 2. To create economic value and protection for resources which otherwise have no perceived value to residents, or represent a cost rather than a benefit.

- 3. To give alternative source of livelihood for the poor people of the area through eco-tourism.
- 4. To create awareness of this useful resource amongst the local people.
- 5. To introduce a concept of Education through Recreation.

The Government of India, North Eastern Council Secretariat, Nongrim Hills, Shillong-793 003 vide Letter No. NEC/TRSM/SK/ ECO-TOURISM/302/2012 dated Shillong, the 18th March, 2013 has accorded Administrative Approval to the project "Development of Eco-Tourism and Allied Activities at Chauri Dara, Green Village in South Sikkim" at an estimated cost of Rs. 363.41 lakhs (Rupees three crore sixty three lakhs forty one thousand) only on 90:10 basis, out of which



Rs. 327.07 lakh will be borne by the Government of India and the rest Rs. 36.34 lakhs (Rupees thirty six lakhs thirty four thousand) only by the State Government.

### 4. Establishment of Sidkeong Tulku Bird Park, Rabdentse, West Sikkim

The construction of Sidkeong Tulku Bird Park, Rabdentse, West Sikkim was conceived with an objective to pay homage to the Father of Forestry (the then king of Sikkim) who had first introduced modern forestry in Sikkim. This Rabdentse area (Old Palace) having historical importance also houses myriads of birds and in order to show case this magnificent hotspot to outside world to attract unstinted tourist both domestic and foreigners is the basic idea behind this thereby boosting business of the stakeholders. The infrastructures were created to give the best ideal natural habitat to these birds within this Park and also to attract migratory birds to rest for a while and facilitate breeding also.

### **Background of The Project**

The project was initiated in the year 2008-2009 involving an area of 13,000 sqm. at the total cost of Rs. 684.85 lakhs including 15% above on civil cost sanctioned under one time grants ACA/SPA in the year 2008.

5. National Afforestation Programme (NAP): Forest Development Agency North, East, South & West (Territorial & Wildlife) and KNP

**NAP** is a flagship program of the Ministry of Environment, Forests and Climate Change which aims at augmenting the forest and tree covers of the country in pursuance of the goals enshrined in the National Forest Policy 1988. It is being implemented in the participatory mode of involving the grass roots level communities, the Joint Forest Management Committees (JFMCs) and the Eco Development Committees (EDCs). The plantation are planned and executed by these JFMCs and EDCs in their own areas.

#### **Objectives of the Scheme**



Stone Wall fencing at Dentam, West Sikkim to control Human-Wildlife Conflicts

The hierarchy of objectives of the Scheme described in the Logical Framework' format is as follows :(I) Super-Goal: Sustainable development and management of forest resources.

- (ii) Goal: Increase and/ or Improve Forest and Tree Cover (FTC)
- (iii) Purpose: Rehabilitation of

degraded forests and other areas by institutionalizing decentralized/ participatory forest management and supplementing livelihoods improvement processes

#### **Project Area**

The Scheme will be implemented to regenerate, afforest or reforest degraded forests and adjoining lands, under both public as well as private tenure. Due priority will be given to the treatment of problem, eco sensitive and disaster prone areas, such as coastal areas, mangroves, ravines, shifting cultivation areas, cold and hot arid areas, tank foreshore, strips along public infrastructure, etc. Project area will be selected in a manner that the major part is forest or public lands. Agro-forestry model may be permitted on non-forestlands, including for rehabilitation of shifting cultivation lands and tree plantation in cold arid areas. Preferably blocks of 5 hectares and above will be takenup for treatment under a project; however, smaller area may be taken up if the JFMC/EDC has agreed to offer additional voluntary support required



Raised Platform for Salt-Licks for Wildlife

for regeneration and maintenance of a smaller area

#### 6. Green India Mission:

The National Mission for a Green India has been approved by the Prime Minister's Council on Climate Change. The Mission is one of eight missions under India's National Action Plan on Climate Change (NAPCC). The Mission aims to increase the quantity and quality of 10 million ha. of forest area, achieving an annual  $CO_2$  sequestration of 50 to 60 million tones by 2020.

### **Mission Objective**

The Mission objective is to increase forest/tree cover on five million ha. of forested and degraded forest land, and improved quality of forest cover on another 5 million ha - a total of 10 million ha. The Mission will also focus on improvement of ecosystem services, including biodiversity, hydrological services and carbon sequestration, and aim to increase forest-based livelihood incomes for 3 million forest dependent families. In terms of carbon sequestration, the mission aims to reach an annual CO<sub>2</sub> sequestration of 50 to 60 million tones by 2020, which will increase the share of green house gas (GHG) emissions offset by India's forest and tree cover to around 6 percent as compared to 4.5 percent that would have been offset in the absence of the Mission. The perspective plan of this Mission for Sikkim has been formulated.



### 7. Integrated Watershed Management Program

The Integrated Watershed Management Program is being implemented in Sikkim since 2009. It focuses on promotion of livelihood activities, soil conservation in agricultural & neighbouring forest land and augmenting of irrigation facilities on farmland. It is a people-centric program and is being implemented through grass roots level watershed committees. A total of 11 watershed projects are under implementation of which 3 (Dzongu, Rhenock and Gnthang-Nathula) are nearing completion and the rest are in various stages.

### 8. Integrated Forest Management Scheme

This scheme is being implemented by the Territorial & Working Plan wing of the Department. It is aimed at enhancing infrastructure & field action for forest protection from forest fires and other anthropogenic activities.



## 9. Integrated Development of Wildlife Habitats

This scheme is being implemented by the Wildlife wing of the Department and aims to develop and conserve wildlife habitats in the protected areas of the State.

## Sikkim Biodiversity Board 2006-2016:

The Sikkim Biodiversity Board (SBB) was established as a statutory body under the government in 2006, after notification of the Sikkim Biological Diversity Rules in 2006, to enable (i) Conservation of our biodiversity, (ii) Sustainable use of bio-resources and (iii) Fair and Equitable Sharing of Benefits under an Access and Benefit Sharing (ABS) mechanism. Headquartered in Forest Secretariat, Deorali, Gangtok, its principal mandate is the establishment of grass-root level Biodiversity Management Committees (BMCs) at GPU level, whose priority is documentation of the existing bio-resources including traditional knowledge holders, village elders, etc. in People's Biodiversity Registers (PBRs), among several other activities such as identification of Biodiversity Heritage Sites (BHS).

Over the decade, annual celebration of International Biodiversity Day in all districts is a regular phenomenon. In 2010 the International Year of Biodiversity (IYB-2010), a One-Species-Per-Day initiative in local media was successfully carried out and was the only one of its kind in the country. A unique exhibition on Seeds and Stamps on Biodiversity was organized, as were others like "Sikkim: an Island in the Sky".

Documenting of Heritage Trees of Sikkim started in 2009; Pictorial Field Guides (Books)

on Mushrooms of Barsey Rhododendron Sanctuary and Ferns & Fern Allies of Sikkim; Posters on Butterflies, State Symbols, Endangered Wildlife of Tso Lhamo Plateau; Compilation of lists of Threatened Species of Sikkim for formal notification by MoEFCC.

SBB **UNEP-GEF-**The secured а MoEFCC-ABS project "Strengthening the Implementation of the Biological Diversity Act with focus on its Access & Benefit Sharing Mechanism" and along with Grantin-Aid from the Government of Sikkim formed 28 BMCs to date; one PBR facilitated by Foundation for Revitalizing of Local Health Traditions (FRLHT) Bengaluru; four more PBRs in the pipeline; a batch of Village Botanists trained by FRLHT, documentation of Tradeable Bio-resources; at least two ABS Agreements in pipeline.





### Gist of Achievements of SBB:

### Activities:

- 1. Formation of Biodiversity Management Committees: 28 BMCs at GPU level.
- 2. Celebration of International Day of Biodiversity (IBD) on 22.05.2016 every year on various themes such as

2016 - Mainstreaming Biodiversity; Sustaining People and their Livelihoods

2015 - Biodiversity for Sustainable Development (Exhibition of Seeds and Stamps)

2014 - Island Biodiversity (Sikkim, an Island in the Sky)

2013 - Water and Biodiversity (Awareness at BMC and District levels)

2012 - Marine Biodiversity (Awareness on Ocean Lake Gyam Tsona, North Sikkim)

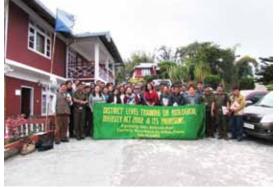
2011 - Forest Biodiversity (Awareness programmes)

2010 - Biodiversity, Development and Poverty Alleviation

2009 - Invasive Alien Species (Awareness for Line Departments)

2008 - Biodiversity and Agriculture

2007 - Biodiversity and Climate Change



District level training-west



Public representative meeting

- 3. Preparation of one People's Biodiversity Register by Lingee Sokpay BMC, South Sikkim, three more in the making for 03 BMCs.
- 4. Awareness programmes at various level for Panchayats, Line Departments, Research institutions, local entrepreneurs and legislators of Sikkim; use of media such as All India Radio (AIR) Gangtok
- 5. Organized training and workshops.
- 6. Hosting of website at: www.sbbsikkim. nic.in; launched during International Seminar on Khangchendzonga National Park, Chintan Bhawan, Gangtok



District level training-east

7. Framing of "Guidelines for Collection, and Commercialization Harvesting of Ophiocordyceps sinensis" for Caterpillar-Fungus (Yartcha Gombuk)

### **Publications:**

- 1. Printing of 03 sets of Rhododendron posters.
- 2. 11 page flyers on Biological Diversity Act 2002 and salient features (Eng & Nep).
- 3. Printing of booklets for dissemination:
  - a) ABS Guidance Manual
  - b) Biological Diversity Act 2002

- c) Guidelines on Biodiversity Heritage Site
- d) BMC Operational toolkit
- e) Toolkit on Local Biodiversity Fund
- 4. Translation into Nepali language and printing:

a) BMC operational Toolkit

b) ABS guidance Manual

- 5. Printing of flyers on: Biodiversity in religion.
- 6. Printing of information leaflet on: "Potential ABS Bioresource in Sikkim".
- 7. Printing of reports of various programmes for dissemination.



District level training-east



Gyaten-Karmataar



Passingdang-saffu



State level training

**Board Meeting** 



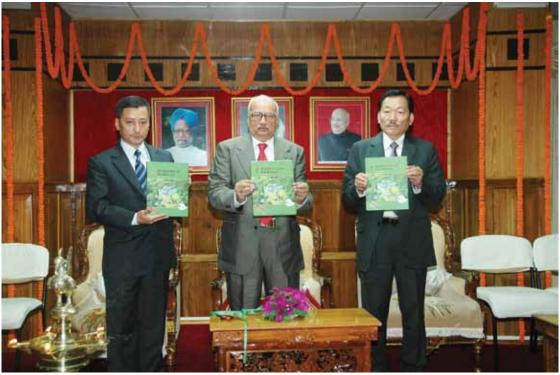
District level training-north



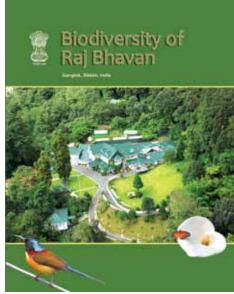
Assam lingzey

**ABS Mangan** 

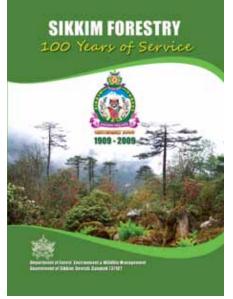
Negotiation skills



Book on Biodiversity of Raj Bhavan prepared by FEWMD in 2010 (International Year of Biodiversity) and published by HE the Governor of Sikkim

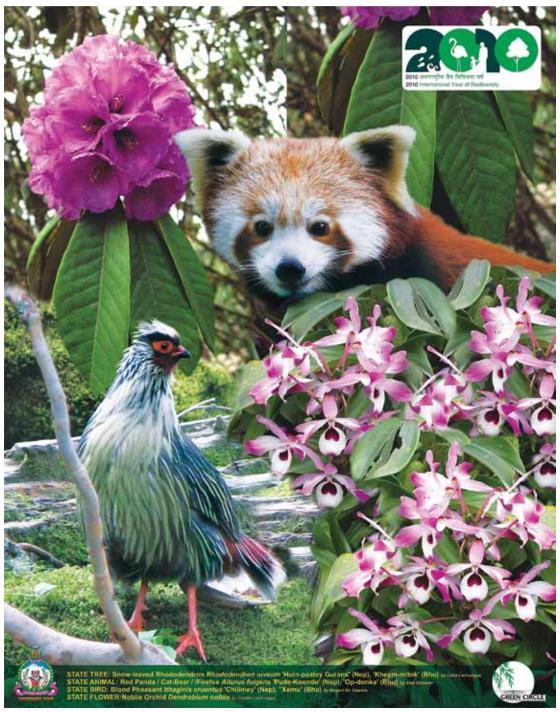


Biodiversity of Raj Bhavan



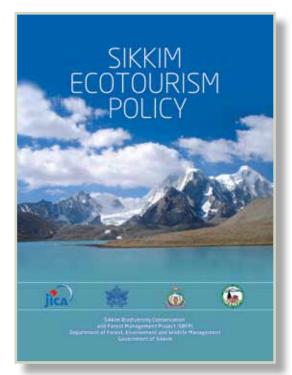
Book on Forest Centenary 1909-2009 published

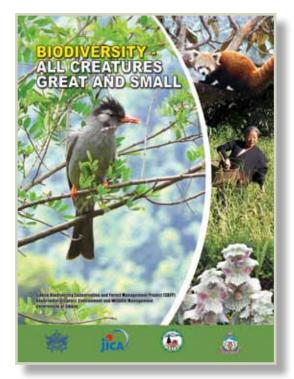
### STATE SYMBOLS OF SIKKIM





Wild Biodiversity of Raj Bhawan Complex, Gangtok

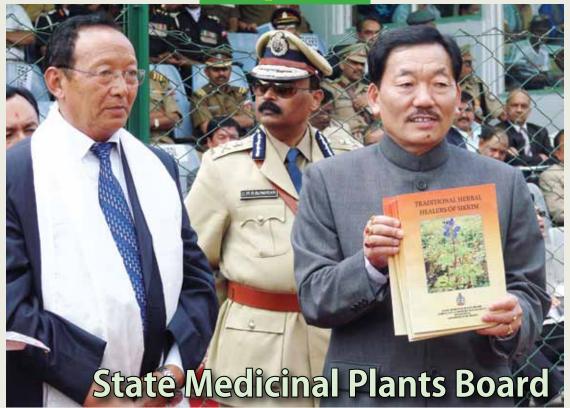






A forester receiving commendation from the Chief Minister during State Green Mission

### Chapter VI



#### 1. History of State Medicinal Plant Board:

State Medicinal Plants Board of Sikkim was set up under NTFP Sector of Forests, Environment & Wildlife Management Department, Government of Sikkim by the State Government as a State Level Body vide Notification No. 100/FEWMD dated 10<sup>th</sup> June 2002. The Chief Minister is the Chairman of State Medicinal Plants Board.

### 2. Contractual Farming Scheme: (2003-2009)

The scheme was implemented during 10<sup>th</sup> & 11<sup>th</sup> Plan period w.e.f 2003-2004 to 2008-2009 with the objectives to produce and ensure sustained quality planting medicinal plants materials and to develop marketing mechanism. State Medicinal Plants Board

Release of book on Traditional Herbal Healers

prioritized the domestication of species like Aconitum ferox, Picrorrhiza kurroa, Nardostachys jatamansi in high altitude area and Swertia chiraita, Aloe vera, Asparagus racemosus, Gloriosa superba, Stevia rebaundiana, Ocimum sanctum in low altitude area. Under this scheme, National Medicinal Plants Board, Department of AYUSH, Ministry of Health and Family Welfare, Government of India, New Delhiprovided 30% subsidy for cultivation of above mentioned medicinal plants in private holding by farmers for commercial purpose.

For this scheme, 84 nos. of contractual farmers were identified by State Medicinal Plants Board and total subsidy of Rs.167.81 lakhs were released to the farmers through cheque.

### 3. Jari-buti Kosh: (2004-2005)

Jari-buti Kosh (Herbal Medicinal Fund) was created under State Medicinal Plants Board in the year 2004-2005 by the State Government. The main objectives was to revitalize traditional knowledge of herbal medicine for health security to the local community, documentation of indigenous knowledge of medicinal plants and their uses, protection of Intellectual Property Right of local communities and transmission of traditional knowledge of medicinal culture to younger generations.

A small grant of Rs. 5.00 lakhs had been earmarked under Jari Buti Kosh scheme to provide incentive to Traditional Folk Healers.

Out of this allocated fund Rs. 2,00,000/- had been distributed to 7 renowned folk-healers during 2005-2006 and 2006-2007.

The remaining Rs. 3,00,000/- was distributed to 20(Twenty) renowned identified Folk healers as financial assistance for development of their home herbal gardens and providing infrastructure support.

The State Medicinal Plants Board has the directory of the indigenous knowledge and method of treatment practiced by the Folk healers.

## 4. National Campaign on Amla: (2011-2013)

The National Medicinal Plants Board, Department of AYUSH, Ministry of Health and Family Welfare, Government of India, New Delhi launched a nation-wide Amla Campaign to promote consumption and planting of Amla in all the available public premises with wide publicity through State Medicinal Plants Board(SMPB) implemented the state-wide campaign on Amla from 2010-11 till 2012-13 to promote consumption of Amla fruit and planting of the Amla seedlings in all in available public premises like Schools, Colleges, Private institution, Kitchen gardens and Government Lands by involving different stakeholders to provide nutrition and promote health care benefits specially to school children and public in general.

SMPB identified 6(six) number of Schools in North District, 24(Twenty four) schools in East District, 28(Twenty eight) in South and 24(Twenty four) Schools in West District and distributed 55,000 Amla seedlings. Besides schools, the seedling was also distributed to interested farmers. SMPB spread the awareness on natural benefits and curative propertied through distribution of brochures, print media, local fair etc.



Meconopsis horridula



Lashar Saussurea obvallata

### 5. Inventorisation of Medicinal and Aromatic Plants of Sikkim:

The State Medicinal Plants Board. in collaboration with Foundation for Revitalization of Local Health Tradition (FRLHT), Bangalore inventorised the medicinal and aromatic plants of Sikkim. The total of 1681 plants were identified as medicinal and aromatic out of which 297 were trees. 279 were shrubs 957 were herbs and 148 were identified as climbers. The CD containing the list of 1681 identified medicinal and aromatic plants were released on the occasion of World Environment Day 2013 at Namchi.

### 6. Establishment of Medicinal Plant Conservation Areas MPCAs: (2012-13)

Sikkim has rich diversity of medicinal plants especially in Alpine and Sub-Alpine forest areas. The conservation, development and sustainable management of these rare and endangered species of medicinal plants is very necessary. It is well established that *in situ* conservation is the best, the quickest and the cheapest method of conserving the diverse genetic base of various plant species. Hence 400 Ha in North District at Lasher Valley, 100 Ha in East at Tamzey RF, 250 Ha in South District at Mamring RF, 50 Ha in West District at Sipsu RF were established as MPCAs.

These MPCAs were then surveyed rigorously for floristic diversity and documented.

Based on the survey report rapid threat assessment of medicinal plants through an internationally accepted mechanism of CAMP (Conservation Assessment and Management Prioritization) workshop developed by IUCN was conducted in 2014 with technical assistance from FRLHT, Bangalore.

During Pre-CAMP and CAMP workshop, participated by State Medicinal Plants Board and State Forest Department officials, Botanical experts, field botanists, IUCN medicinal plants specialist group members (IUCN MPSG), students, healers, researchers, medicinal plant species were prioritized by revisiting list of 126 species. They short listed 49 potential candidates for assessment and summarized the report. Out of 49 species, 29 species were vulnerable, 9 were near threatened, 5 endangered and 4 were data deficient.



Rheum nobile

## 7. Establishment of Home Herbal Garden: (2014-15)

In order to promote awareness about traditional usage of medicinal plants among the urban and rural household and public at large, the National Medicinal Plants Board financed the establishment of Home Herbal Garden. Hence, State Medicinal Plants Board identified 50 household and a grant of Rs. 2000/- per Home Herbal Garden was distributed to them.

## 8. Linkage with Joint Forest Management Committees (JFMCs):

As per the Forest Act, the forest dwellers and tribals living near forest have been given full right to NTFPs. The Government of Sikkim has lifted the ban on sustainable collection of medicinal plants from the areas where the NTFP Divisions have been carrying out ex situ conservation of medicinal plants. With the focus on production aspects and activities for creating storage, primary processing marketing, infrastructure and financial support is being provided to 30 JFMCs in Sikkim. The financial assistance is provided by National Medicinal Plants Board through State Medicinal Plants Board, Government of Sikkim.



Lashar Valley MPCA

### 9. Ex-situ Conservation of Rare Endangered and Threatened(RET) Species:

As a complementary action to conserve the genetic diversity of Rare Endangered and Threatened (RET) Species, the Ex-situ conservation method is adopted by SMPB. The project is being implemented by NTFP Division of Forest, Environment and Wildlife Management Department, Government of Sikkim. Since 2009, around 3000 Ha. of plantation of medicinal plants have been carried out till date. The RET species like Aconitum spp., Nardostachys jatamansi, Podophyllum hexandrum, Picrorrhiza kurroa, Dactylorrhiza hatagiera, Juniperus recurva, Taxus baccata, Berberis aristata, Hippophea salicifolia in high altitude area and Terminalia bellerica, Terminalia chebula, Digitalis purpurea, Phyllanthus emblica etc. are planted under different project schemes.



Bistorta sp.



Floristic study being caarried out in Tamzey MPCA

## Prohibition of commercial extraction of minor forest produce from the wild

Non timber forest produce or minor forest produce mainly consisting of medicinal plants were being collected on a large scale from the reserved forests. This had led to alarming depletion of stocks of some medicinal plants especially the varieties used for making incense which are found only in the high altitude alpine areas of the State. Other species of plants used in alternative medicine and Tibetan medicine found in different parts of the State are also highly valued in the national and international markets.

To preserve the mother stock of these plants and to ensure that the gene pool of valuable plants is preserved, the Government imposed a ban on the commercial collection of medicinal plants in 2001. The ban was initially imposed for a period of five years but the same has been extended and is in force even now. However, this does not affect collection by villagers of wild medicinal plants for local consumption or commercialization of cultivated medicinal and other wild plant varieties. A quality control research laboratory is being set up in the Forest, Environment & Wildlife Management Department to test the active principle content of the medicinal plants found in the State. Future efforts will focus on commercial cultivation of high value medicinal plants.

### Chapter VII

## Sikkim Biodiversity Conservation and Forest Management Project



Release of the Rapid Biodiversity Report by HCM

In 2010 a Memorandum of Understanding was signed with the Government of Japan through Japan International Cooperation Agency (JICA) for providing financial assistance for Sikkim Biodiversity Conservation and Forest Management Project (SBFP) that was to be implemented by the Forest Environment and Wildlife Management Department from year 2010-11. The main objective of the project is biodiversity conservation by means of strengthening the forest management capacity through improvement of infrastructure, capacity building, encouraging scientific studies and also to simultaneously improve livelihood of the local people who are dependent on forests and living in forest fringe areas through Joint Forest Management and Ecotourism. The project has a financial outlay of Rs 330.57 crores and is to be implemented over a 10-year period.

The main components of the JICA-assisted SBFP are as follows:

## **Forest and Biodiversity Conservation**

This component aims to enhance the global, social, and economic value of biodiversity and improve livelihoods in and around protected areas (PAs), buffer zones, and reserved forests. It seeks to achieve this objective through the establishment and implementation of sound management plans and the dissemination of biodiversity information for promoting public awareness on the significance of biodiversity. Although the main focus is on the management of public lands, it will also support sustainable forest and biodiversity management outside the reserved forests and PAs. It is aimed to strengthen the development and implementation of the management plans for the Khangchendzonga National Park and the seven wildlife sanctuaries. It will identify the resource gaps that need to be filled for the effective implementation of the plans. It also

aims to further improve the existing working plans for forest management.

In order to safeguard forest and biodiversity resources through scientific and systematic planning, accurate land-based spatial information is being collected and assembled for utilization. Under the project topographical maps will be developed that will be used for the conservation of biodiversity by updating the existing map sheets. These maps will be made by extracting information from satellite imageries and through ground truthing. The maps will assist planners and decisionmakers, including government agencies, donors, and private entities, not only in land use and biodiversity conservation but also in development planning. Analysis and interpretation of high resolution satellite

images of MX-4 P-6, Cartosat, and Quick Bird will be conducted. Thematic information will be extracted to create maps on vegetation types, forest resources, land use, human intervention assessment, landslide assessment, biodiversity assessment, tourism and ecotourism for use by the government and the private sector. Officers and field staff will be trained at the Indian Institute of Remote Sensing at Dehradun or other appropriate institutes.

The objectives of inventory and monitoring of biodiversity is to develop baseline information on key biological elements in forest, alpine, freshwater, and agro ecosystems for monitoring and evaluation of the impacts of forest and biodiversity management and to identify critical areas that require immediate protection. To enable this rapid biodiversity surveys, which would display the ecosystems throughout the state, will be conducted. The survey will be carried out using both the coarse filter and fine filter approaches. Approximately 1,000 sample plots will be randomly generated throughout Sikkim for quantitative biodiversity study using the digital spatial information base. In addition, known hotspots in forest, alpine, freshwater, and agro- ecosystems will have approximately 300 more plots to present more detailed information.

Improvement and Monitoring of the Protected Area Management Plans will be undertaken. The project will support the implementation, improvement, monitoring and evaluation of the plans to bring the management of the protected areas in Sikkim up to the international level.. Hence the findings from the biodiversity baseline surveys and other studies supported under the Project shall be reflected in the management plans.

The Management and Conservation of Flagship Species Habitats is being undertaken to manage and conserve flagship species studies, especially focusing on red panda, musk deer and black bear. Studies will be carried out to estimate their population density and ranges and to understand their migratory, feeding, and reproduction patterns, their interaction with humans. Understanding their population dynamics in relation to natural and human interventions is particularly important for the sustainable management of flagship species.

The enhancement of Working Plans and establishment of Forest Management Zones is being carried out and the land use of areas outside the PA network will be rationalized under this subcomponent. The detailed inventories involving field observations will be conducted to cluster forest areas by topography, soil condition, climate, location, vegetation, and socioeconomic condition. Compartments and sub-compartments will be defined and redefined, and surveyed and demarcated. Surveys will also be conducted to determine the management regime, including the silvicultural regime for each cluster. A regular monitoring system of forest resources will also be set up and implemented. The outputs of this subcomponent will be included in the forest and biodiversity information base.

The inscription of the Khangchendzonga National Park on the World Heritage List has been carried out by preparation of a detailed document on the outstanding universal value of the KNP.



# Ecotourism:

The ecotourism component under the project is designed to develop and improve the sector for the benefit of local forest fringe communities while ensuring environmental conservation. It focuses on

- Policy, strategy, regulation, and resolving bottlenecks impeding the development of the sector;
- Marketing Sikkim's ecotourism opportunities and creating linkages between suppliers;
- Developing areas for specific forms of tourism;
- 4) Developing ecotourism facilities;

- 5) Improving the design, production, and sales of handicrafts;
- Devising a waste management collection and disposal system at selected tourist areas;
- 7) Capacity development.

The ecotourism component of the project has two principal objectives:

- Providing income generation opportunities to local communities living in the forest fringe, and
- Ensuring that the impacts of developing ecotourism do not damage the environment.



The impacts of this component are three-fold: Ecotourism is developed in every district of Sikkim following sound environmental and business principles, restrictions impeding the operation of ecotourism are eased, and the sector is well understood by all stakeholders. Ecotourism in Sikkim is strongly marketed in India and abroad, and awareness of the ecotourism opportunities available is raised in the appropriate marketplaces. Many jobs are created for the local communities, and income generation opportunities are improved and multiplied. The main public sector implementation organizations and partners are the Forestry Department, executing the project through the JFMC, EDC, and PSS schemes, and the Tourism Department. Other state government departments will be brought in for implementation of certain project components. The main partners in the private sector include the Travel related associations as well as the local communities that are or will become tourism service providers. NGOs will also be involved in certain activities.

An ecotourism policy has been framed on international standards that is in consonance with the local conditions of Sikkim. This policy was drafted after intensive local consultation so that the local community's view points and interests are well represented.





The impact of the ecotourism marketing component will be that greater awareness of Sikkim as a tourist destination is created in national and international market places, resulting in an increase in the number of tourists that come to Sikkim to enjoy ecotourism and adventure tourism activities, thus generating revenue and employment for local communities.

A product development and improvement strategy will provide local communities offering tourism services with advice and possible access to micro-financing. This will also include an initiative to link tour operators with ecotourism service providers in the local community. Further a market research strategy to provide essential information on the markets visiting Sikkim and potential markets that will be targeted in the strategy.

It will aim to providing links between producers and suppliers in the supply chain.

It will also play an important role in the product development and improvement strategy. In order to encourage the development of Ecotourism Areas with Respect to Specific Market Segments diverse products will be developed at selected areas in the state. For instance the development of trekking routes, establishment of Wildlife Watching Areas. Once the trekking routes are developed its marketing should be the main focus. Similarly in Development of Wildlife-Watching Areas surveys should be conducted



for the development of the biodiversity information base, some locations with high probability of sighting mammals along the trekking routes, and other areas will be selected for the establishment of wildlife-watching areas. For bird-watching, easily accessible sites with reasonable number within a maximum of one hour's journey from the accommodation will be developed.

To improve the visitor experience, appropriate infrastructure will be developed throughout Sikkim to provide interpretation and information on areas of tourism interest, directions, and comfort facilities. This would be aimed to not only provide a clean environment for tourists to enjoy the destination but will also improve the living conditions of the local community and provide income generation opportunities.





# **Joint Forest Management**

Khechupalri Lake in West Sikkim being conserved by Khechupalri Pokhri Sangrakshan Samiti.

This component aims at improving the management of forests and the conservation of biodiversity through the engagement of forest fringe communities. It will also provide opportunities for these communities to enhance their livelihood through forestry, ecotourism, and other income generation activities (IGAs). The expected outcomes include the following: increased tree cover; enriched forests and alpine vegetation; sustainable management of forest resources adopted and popularized; flora and fauna better-protected from threats such as fire, indiscriminate exploitation, and overuse by tourists; improved village facilities; diversified livelihood options including the development of ecotourism; reduced state dependence; and improved income of forest

fringe communities. This component will adopt the joint forest management approach practiced widely in India including Sikkim. Existing JFMCs, EDCs, and PSS's will be taken up or new ones created at the village level for project intervention.

Activities that are being taken up under the JFM component determined through the process of microplanning are as follows:

#### i) Common Activities

The protection of forests, wildlife, and the environment should be made mandatory for all JFMCs, EDCs, and PSS's. Activities are undertaken based on the guidelines/manuals on implementation of activities. Examples of activities to be undertaken by all the target committees should include the following:

- Fire prevention and control: Committee members will regularly patrol and watch for fires during the dry season. Each committee will be provided with fire-fighting equipment. Basic training on fire fighting will be given to the committee members through the capacity development subcomponent.
- Monitoring and reporting of illicit activities: The areas to be managed jointly will be patrolled regularly by committee members. Illegal felling, poaching, encroachment, bio-piracy, and other criminal activities will be monitored and reported to the Forest Department by the committee members.
- Range management: The committee will regulate grazing and fodder collection under the guidance of the Forest Department so that resources



will be managed sustainable manner. Measures such as rotational grazing, prescribed burning, mechanical clearing, and seeding will be applied taking into account the local situations.





#### ii) Optional Activities

Other activities being implemented by JFMCs, EDCs, and PSS's is based on the type of committee, the area it looks after, and its needs concerning natural resources. For JFMCs, silvicultural activities such as planting trees and NTFP species, and thinning forests would be the main focus of activities. In higher-altitude areas, planting and harvesting medicinal herbs may become the main activities. For EDCs, management of the national park and sanctuaries including the maintenance and restoration of wildlife habitats, maintenance of gates, fences, and footpaths, and guiding of the visitors are being taken up. PSS's will mainly look after the lake environment and the surrounding areas by making sure that they are not overused or polluted. These include the following.



- Artificial regeneration in reserved and protected forests: Trees are planted in areas that have not had success in natural regeneration. These are verified at the microplanning stage. Fences will be installed for protection in areas where the population density of animals is high.
- Aided natural regeneration: Controlled burning and/or light soil working will be done to aid regeneration in sal (*Shorea robusta*) and other forests where the status of regeneration is poor.



Protection of Plantation Area from grazing by JFMC members

- Maintenance of forests: Weeding and climber cutting will be done where required. For plantation forests, weeding will be done for three years or more.
- 4) Management of the national park and sanctuaries: Activities such as the maintenance and restoration of wildlife habitats, control of invasive alien species, construction and maintenance of gates, fences, and footpaths, guiding of the visitors, collection of entrance fees, and collection of solid waste will be conducted by EDCs.

- 5) Mitigation of man-animal conflicts: The committee members will assist in the monitoring of wildlife with the Forest Department.
- 6) Soil and moisture conservation
- Lake management: PSS's will manage the lake environment. Visitors will be regulated, entrance fees will be collected and business activities and littering will be controlled by PSS's.

Forest management in religious areas are also being undertaken in Sikkim, large tracts of forests are sacred groves which are under management of religious institutions such as monasteries and temples. These sacred groves and forests bear not only religious and cultural values, but also highly important in terms of biodiversity because they have long been protected. The Project supports conservation of such sacred groves and other religious areas by providing technical services and enhancing plantation and protection activities by religious institutions.



Community Organisers being trained on Forest Inventory



Control Burning in Sal Forest by JFMC/EDC members at Zoom in West Sikkim



Monitoring of field works by senior forest officers



Bamboo and wood based household items made by SHG

## Organizational Strengthening of the Forest Department

This component is designed to enhance the capacity of the Forest Department to deliver forest management and biodiversity conservation services efficiently. This component focuses on the followings.

- improvement of physical infrastructure and equipment of the Forest, Environment & Wildlife Management Department.
- training of the Forest, Environment & Wildlife Management Department officers and frontline staff members, and establishment of a financial mechanism to secure the sustainable management of activities and infrastructure.



### Some of the key achievements in the project:

### 2010

- 1. MOU was signed with the Government of Japan through Japan International Cooperation Agency (JICA) for providing financial assistance for Sikkim Biodiversity Conservation and Forest Management Project (SBFP)
- 2. International Workshop on ecotourism was held on October 2010 followed by stakeholders consultation meeting

### 2011

- Cabinet approved the "Sikkim Ecotourism Policy" on 28<sup>th</sup> Nov 2011
- Eco-tourism Marketing Cell (EMC) participated in South Asian Travel and Tour Expo, 2012, Delhi from 10<sup>th</sup> to 12<sup>th</sup> Feb 2012. The EMC introduced existing ecotourism products of Sikkim and also the products which are being developed under the project to visitors and interacted with representative of 173 organizations which included tour operators, event's organizers, travel & adventure organizers.
- A workshop on "Integration of GIS in Forest Management" was organized at Gangtok on 8<sup>th</sup> December 2011.

### 2012

- Notification of Sikkim Ecotourism Policy brought out vide Sikkim Government gazette notification 308, dated 30<sup>th</sup> June 2012.
- The Sikkim Ecotourism Policy was released by His Excellency the Governor of Sikkim on Republic Day on 26<sup>th</sup> Jan 2012.
- 3. Initiated the construction of the SBFP office building on the 1<sup>st</sup> October 2012.

- 4. Guidelines for JFMCs brought out in the form of the following. (i) Joint Forest Management Manual Part I (Manual for establishment and operationalization of Joint Forest Management committee, Pokhri Sanrakshan Sanity and Self Help Groups for income generation).
  - (ii) JFM Manual Part II, the facilitators handbook for micro planning.
  - 5. A training programme was organized during 22-29 July 2012 in collaboration with Wildlife Institute of India, Dehradun. The training programme was designed to familiarize researchers with sampling techniques, designs and analytical tools and techniques related to biodiversity surveys and focused ecological studies.
  - 6. Initiated construction on the following and all completed in 2014
    - 1. Gyalshing Range Office and Block Office, West Sikkim
    - 2. Soreng Block Office, West Sikkim
    - 3. Yoksam Block Office, West Sikkim
    - 4. Ravangla Range Office, South Sikkim
    - 5. Namchi Range Office cum Block Office, South Sikkim
    - 6. Lachung Range Office, North Sikkim
    - 7. Singtam Range Office, East Sikkim
    - 8. Rangpo Block Office, East District
    - 9. Phadamchen Range Office, East Sikkim
    - 10. Ranipool Block Office, East Sikkim
    - 11. Lachen Range Office, North Sikkim
    - 12. Construction of check post at Gyalshing, West Sikkim

- 13. Lachen Range Office, North Sikkim
- 14. Check post at Gyalshing, Phongla, Lachung and Rorathang
- 15. Construction of Block office cum quarter at Kitam, South Sikkim

### 2013

- 1. Initiated the construction administrative Block/Reconstruction of the Himalayan Zoological Park.
- State Level Workshop on Joint Forest Management for sustainable management of natural resources- livelihood: ecotourism: biodiversity was held on 30<sup>th</sup> September.
- Forest compartment maps, forest type, beat reserved forest, block and range data were converted from Indo-Nepal projection to WGS 84 UTM 45N projection and exported to Geodatabase. Correction of data in 1:50,000 from 1:25,000 scale for the layers like drainage, state district boundary etc, done
- 4. TIN, Digital Elevation Model (DEM), Slope, Multiple buffer zone maps with the interval of 25, 50, 100, 150, 300m maps were generated for Barsey Wildlife Sanctuary using toposheet 40 m contours.
- 5. Outer boundary of Sikkim was digitized from 1:50000 scale SOI toposheet.
- 6. Normalized Difference Vegetation Index (NDVI) model built on Erdas 11
- 7. First batch of 45 JFMCs selected for implementation of JFM component

### 2015

1. Management Effective Evaluation of National Park and Sanctuary completed in collaboration with Wildlife Institute of India.

- Rapid Biodiversity Survey Report II released by the Chief Minister during the Biodiversity Board Meeting on 18<sup>th</sup> February 2015.
- Rapid Biodiversity Survey Report II released by the Chief Minister during the International Workshop/conference on the Cultural and Natural Values of the Khangchendzonga National Park on 15<sup>th</sup> May 2015. International Workshop/ Conference on the Cultural and Natural Values of the KNP on 15<sup>th</sup> May 2015.
- Atlas- Upgradation of Tropical and Land Use Map released by the Chief Minister on 15<sup>th</sup> August 2015.
- The Plant Conservatory inaugurated on the 10<sup>th</sup> April 2015 by the Chief Minister and ticket collection started from November 2015.
- 6. Second batch of 45 JFMCs selected for implementation of JFM component

### 2016

- 1. Initiated the e-tendering of the proposed Butterfly Park at Rangrang.
- 2. Inscription of the Khangchendzonga National Park as a World Heritage Site.
- Redefinition, reorganization and reconstitution of Joint Forest Management committee and ecodevelopment committee. 226 no's of JFM committees reconstituted.
- 4. Self Help Groups formed and financial assistance provided as seed money for income generation activities such as cardamom, piggery, poultry and handicrafts.

**Chapter VIII** 

# **Important Legislations and Policies**

### 1. The Sikkim Forests (Compounding of Offences) Rules, 1998

Forests are open resources and meet the needs of all sections of society, especially the weaker sections whose livelihood in many cases depends on the nearby forests. Under the Sikkim Forests, Water Courses and Road Reserves (Preservation and Protection) Act, 1988, forest officers have been provided with powers to compound offences. It was therefore found necessary to frame rules to allow forest officers to utilize these compounding powers to deal with petty offences which can be settled out of court. The Sikkim Forests (Compounding of Offences) Rules, 1998 lays down the procedure for speedy disposal of forest offences through the compounding option.

### 2. Sikkim Forest Department Reward Rules, 1998

Forest officers have to apprehend forest offenders under trying circumstances sometimes at odd hours and in remote places such as deep inside forests. As a measure of incentive to field staff who sometimes risk their lives to confront offenders and to encourage informants of forest offences, these reward rules have been framed. The rules provide for criteria and amounts to be given as rewards for detection of forest offences and apprehension of offenders of an exemplary or outstanding nature.

### **3. Sikkim Transit of Timber and other Forest Produce Rules, 1999**

Forest produce such as timber, fuelwood,

shuttering wood, non timber forest produce, old and new furniture, medicinal plants etc. were being transported within and out of the State under existing piecemeal notifications dating back to several decades. The Sikkim Transit of Timber and other Forest Produce Rules, 1999 were. framed to regulate the transit of timber and to curb illegal transportation of timber. The rules prescribe the procedure for transporting forest produce within the State and define the authorities who are to issue the transit permits. By virtue of these rules powers have been delegated up to the Divisional Forest Officer level to issue transit permits whereas previously they were all approved in the Head Office. This has made it easier for the public to obtain transit permits for bonafide purposes. Similarly, the penalty for violation of the rules are also prescribed and the procedure in easy-to-follow steps is defined to make forest administration more effective.

### 4. State Forest, Environment and Land Use Policy 2000

For the first time in the history of Sikkim a State Forest, Environment and Land Use Policy was formulated and adopted in 2000. The policy lays out a framework for carrying out forest, environment and wildlife conservation activities and sets a reference for environment related action. It defines the objectives of forest and environment management and stresses the need to maintain sufficient forest cover and environmental sanctity in the face of increased developmental tempo.

### 5. Sikkim Forests Cattle Trespass Rules, 2000

Grazing from reserved forests and plantation areas was banned in the State in 1997. In order to implement the ban it was necessary to provide for rules to deal with cattle trespassing into unauthorized territory for which these rules were framed. The comprehensive rules provide for proper procedure for disposing off cattle trespass cases.

### 6. The Sikkim Forests (Detection, Enquiry and Disposal of Forest Offences) Rules, 2002

The need to provide specific rules for detection, enquiry and disposal of forest offences on the lines of Code for Criminal Procedure was felt as forest officers are invested with powers under the various forest acts to take action to curb forest offences. Forest officers need to act in a manner that they can investigate and press charges against offenders in a court of law. Accordingly, these rules were framed to define the procedure for taking action against forest offenders as well as lay down various types of forms and memos which are to be utilized while dealing with offenders or during the compounding of offences.

### 7. Sikkim Ecology Fund and Environment Cess Act, 2005

One of the very unique Act providing for levy of cess on industries, traders and consumers for using non-biodegradable materials.

### 8. Regulation of Trekking Rules, 2006

The Government has taken up several measures both through developmental

action and legislation to promote sustainable tourism. While several peaks, lakes and rocks have been notified by the Government as sacred, the Regulation of Trekking Rules notified in 2006 lays down a code of conduct that tourists should follow when they are trekking in wilderness areas especially in wild life areas. They contain specific dos and don'ts that tourists should follow while trekking in the State.

#### 9. The Sikkim Private and Other Non-Forest Lands, Tree Felling Rules, 2006

The felling of trees on private lands and on non-forest lands were being done under various old notifications which were simplistic and piecemeal as they were issued at different times as per need. It was therefore necessary to compile and notify new rules by bringing together under one notification the various provisions that existed from time immemorial. These rules were framed to lay down the procedure for approval of felling trees from private lands as well as to facilitate public work by delegating the powers to the district level officials. Previously there was no such delegation as there were no rules under which this could be done.

### 10. The Sikkim Forest (Allotment of Areas for Quarrying of Sand and Stone) Rules, 2006

Quarries were being operated unsystematically for a long time in Sikkim. The Sikkim Forest (Allotment of Areas for Quarrying of Sand and Stone) Rules, 2006 were framed for the purpose of systematizing the process of quarry allotment and to lay down the authority for assessing the potential quarry sites for environmental integrity and issuing environmental clearance for quarrying. Further, these rules also lay down the time limits for action by various authorities so that all quarries are opened at the same time and for the same period. The rules also integrate the notifications of the Government of India issued under the Environment Protection Act 1986 in this regard so that the subject is dealt with under one comprehensive set of rules.

#### 11. Sikkim Ecotourism Policy 2012

The Sikkim Ecotourism Policy 2012 establishes Sikkim as an ultimate and unique ecotourism destination offering memorable and high quality learning experiences to visitors, and to contribute to poverty alleviation as well as to promote nature conservation. It defines the composition, roles and functions of various committees for developing ecotourism and lays down the specific roles of the Directorate of Ecotourism in developing and marketing of ecotourism in the State. Sikkim is India's first State to have a notified Ecotourism Policy.

#### 12. Natural Water Tax Rules 2016

The Sikkim Forests, Water Courses and Road Reserve (Preservation and Protection) Act, 1988 empowers the State to collect a tax on the use of water generated from forested areas. The Natural Water Tax Rules were recently notified to ensure that water is used scientifically and to control unregulated tapping of water from forest areas.

