

Barsey-Singalila

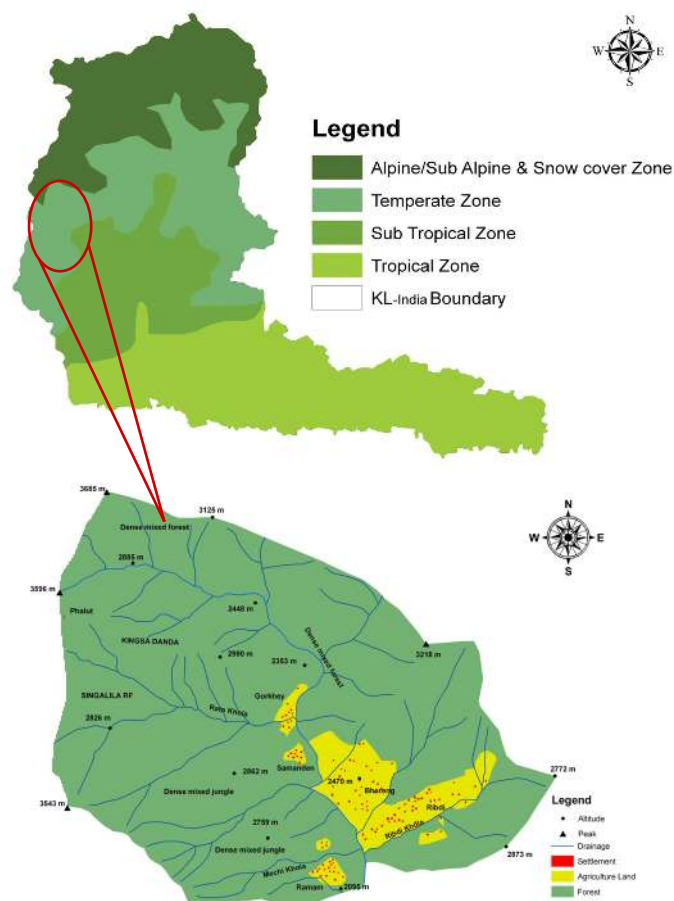
A potential pilot site for conservation and development

Khangchendzonga Landscape Conservation and Development Initiative, India

Following the outputs of a number of regional and national consultations and several interactions with the forest departments (Sikkim and West Bengal), other stakeholders and subject experts, etc., held during the preparatory phase of the Khangchendzonga Landscape Conservation and Development Initiative (KLCDI), India, the Barsey-Singalila site has been identified as one of the important areas for the long-term implementation of KLCDI in Indian part, which is one of the six identified and prioritized pilot sites in Khangchendzonga landscape, India.

As unique transboundary location with eastern Nepal, the Barsey-Singalila pilot site covers parts of west district of Sikkim and Darjeeling district of West Bengal. The site has distinct elements of: a) complex cultural and social assemblage (Nepali and Tribal); b) diverse eco-climatic zones spread along sub-tropical to sub-alpine range; c) close connectivity among PAs, i.e. Barsey Rhododendron Sanctuary (Sikkim) and Singalila National Park (West Bengal); and d) major issues, such as, human wildlife conflicts, limited socio-economic opportunities, weak tourism management and coordination, huge collection of natural resources, unorganized grazing, and other transboundary problems, etc.

Spatially, the Barsey-Singalila site covers 80 km² area, which spreads along 1800 m to 3685 m asl. In addition, the site shares parts of Singalila National Park and Barsey Rhododendron Sanctuary. The Khopi-Ramitey, lower Ribdi, upper Ribdi, lower Bhareng and upper Bhareng (under Ribdi and Bhareng GPU of West Sikkim) and Gorkhey, Samanden and Raman (Darjeeling district) are the existing villages spread within identified site.



The Khangchendzonga Landscape (KL): A part of global biodiversity hotspot, representing unique biodiversity, bio-cultural and geo-climatic assemblage (26°21'40.49" and 28°7'51.25" latitude and 87°30'30.67" to 90°24'31.18" longitude), the KL covers a total area of 25,085.8 Km². The KL is shared by India (56%), Bhutan (23%) , and Nepal (21%). The KL offers life support systems to over 7.25 million people (87% in India, 11% in Nepal and 2% in Bhutan). However, part of KL which lies in India covers a total area 14,061.7 Km² along the altitudinal gradient, ranging from 40 m in Alipurduar and Jalpaiguri districts of West Bengal to 8586 m asl of Mt Khangchendzonga in Sikkim. The KL-India comprises the state of Sikkim, and northern part of West Bengal (three districts, viz. Alipurduar, Darjeeling and Jalpaiguri), located along 26°29'13.56" to 28°7'51.6" latitude and 87°59'1.32" to 89°53'42.96" longitude. Mean temperature varies from 2°C to 19°C in Darjeeling, 7°C to 27 °C in Gangtok and 11°C to 32°C in Jalpaiguri. A significant amount of snow ice and glaciers (11 major high mountain peaks) offers sustained down streams, and multiple land use provides wider biodiversity patterns, i.e. needle leaved forest, broad-leaved forest, mixed forest, shrub land, grassland and agricultural land with high frequency of lakes/ponds (wetlands - 431 in Sikkim and 775 in northern West Bengal) linking with strong socio-economic and cultural fabric. The KL-India comprises rich floral diversity (more than 5500 species), and the faunal taxa (over 1500 in record). With an aim of conserving and governing the rich biological diversity, KL-India has 16 notified protected areas (PAs).

Significance of the Barsey-Singalila Site

Transboundary nature: As an International transboundary location, the site is connected with Nepal and falls in Sikkim and West Bengal states of India. Such close connectivity offers opportunities to the communities of both the nations and domestically in either states for continuing maintaining their long term traditionally woven socio-cultural and economic relationships. The rich and unique biodiversity assemblages commonly represented by either regions provide forum to strengthen common conservation measures by respective area management systems.

Socio-economic pliability: Community of the pilot site is highly depended on the agricultural practices and tourism in identified part of West Bengal (Gorkhey and Samanden Villages); while in Ribdi-Bhareng village (Sikkim), farming is the major occupation. Community people in the site heavily depend on the utilization of natural resources for their livelihood i.e. firewood, wild edible, fodder, timber, etc. Such activities for livelihood are also associated with PAs and close surroundings. The livestock, i.e. Cow, Fowl and Goat, provides average income to the households of the villages.

Protected Area (PA) connectivity: This site shares parts of Singalila National Park and Barsey Rhododendron Sanctuary. The Barsey Rhododendron Sanctuary, situated in the south-western boundary of the West Sikkim district, it extends from temperate to sub-alpine meadows, with magnificent rhododendron (a flagship taxa) forests. Similarly, the Singalila National Park, situated in the extreme north-west corner of Darjeeling district, West Bengal and spreading along the sub-tropical to sub-alpine meadows, has abundance of the rhododendrons. The Red Panda, yet another flagship species is commonly found in either protected areas.

Eco-climatic variability: Barsey-Singalila site is broadly categorized into, a) Sub-tropical (1800 - 2000m asl), b) temperate (2000-3400m asl), and c) sub-alpine (3400-3685m asl) zones.

Biodiversity

Dominant Floral diversity: **Trees:** *Quercus lamellosa*, *Castanopsis indica*, *Rhododendron arboreum*, *Abies densa* are the dominant species. There are unique stands of pure rhododendrons. **Shrubs:** *Berberis aristata*, *Aconogonum molle*, *Rubus ellipticus*, *Daphne cannabina* and *Cissus elongata* are the dominant species. **Herbs:** The dominant species include, *Iris decora*, *Rubia cordifolia*, *Eragrostis* spp, *Drymeria cordata*, *Hemiphragma heterophyllum*, *Viola bicolor*, *Anaphalis contorta*, *Anaphalis margaritacea*, *Fragaria nubicola*, *Rubus* spp, *Cautleya spicata* are the dominant species. **Important medicinal plants:** Bikhma (*Aconitum ferox*), Pakhanbhed (*Bergenia ciliata*), Chimping (*Heracleum wallichii*), Panchaunle (*Dactylorhiza hatagirea*), Siltimbur (*Litsea citrata*), Kutki (*Picrorhiza kurroa*), Chirayito (*Swertia chirayita*)

Faunal diversity: Red Panda (*Ailurus fulgens*), Leopard (*Panthera pardus*), Leopard Cat (*Prionailurus bengalensis*), Yellow-throated Marten (*Martes flavigula flavigula*), Common Palm Civet (*Paradoxurus hermaphroditus*), Goral (*Nemorhaedus goral*), Barking Deer (*Muntiacus muntjak*), Himalayan Asiatic black bear (*Ursus thibetanus*), Wild Dog (*Cuon alpinus*), Crestless Porcupine (*Hystrix brachyura*), Clouded leopard (*Neofelis nebulosa*), Himalayan Mouse Hare (*Ochotona* sp.) and unconfirmed records of Tibetan Wolf (*Canis lupus chanco*).

Avifaunal diversity: Blood Pheasant (*Ithaginis cruentus*), Satyr Tragopan (*Tragopan satyra*), Himalayan Monal (*Lophophorus impejanus*), Darjeeling Pied Woodpecker (*Dendrocopos darjellensis*), Nepal House-Martin (*Delichon nepalensis*) and Red-tailed Minla (*Minla ignotincta*).

Agro biodiversity: Pilot site provides a variety of agricultural crops namely Maize, green Peas, Squash, Beans, Radish, Spinach, Cabbage, Pumpkin, Bitter gourd and Carrots. Different variety of potatoes are also cultivated as prime cash crop of the villages. Gorkhey and Ribdi-Bhareng villages of the site are known for one of the best quality Potatoes in KL-India. Livestock of the site includes Hens, Cows, Horses and Goats. Horses being used for the transportation of goods locally.

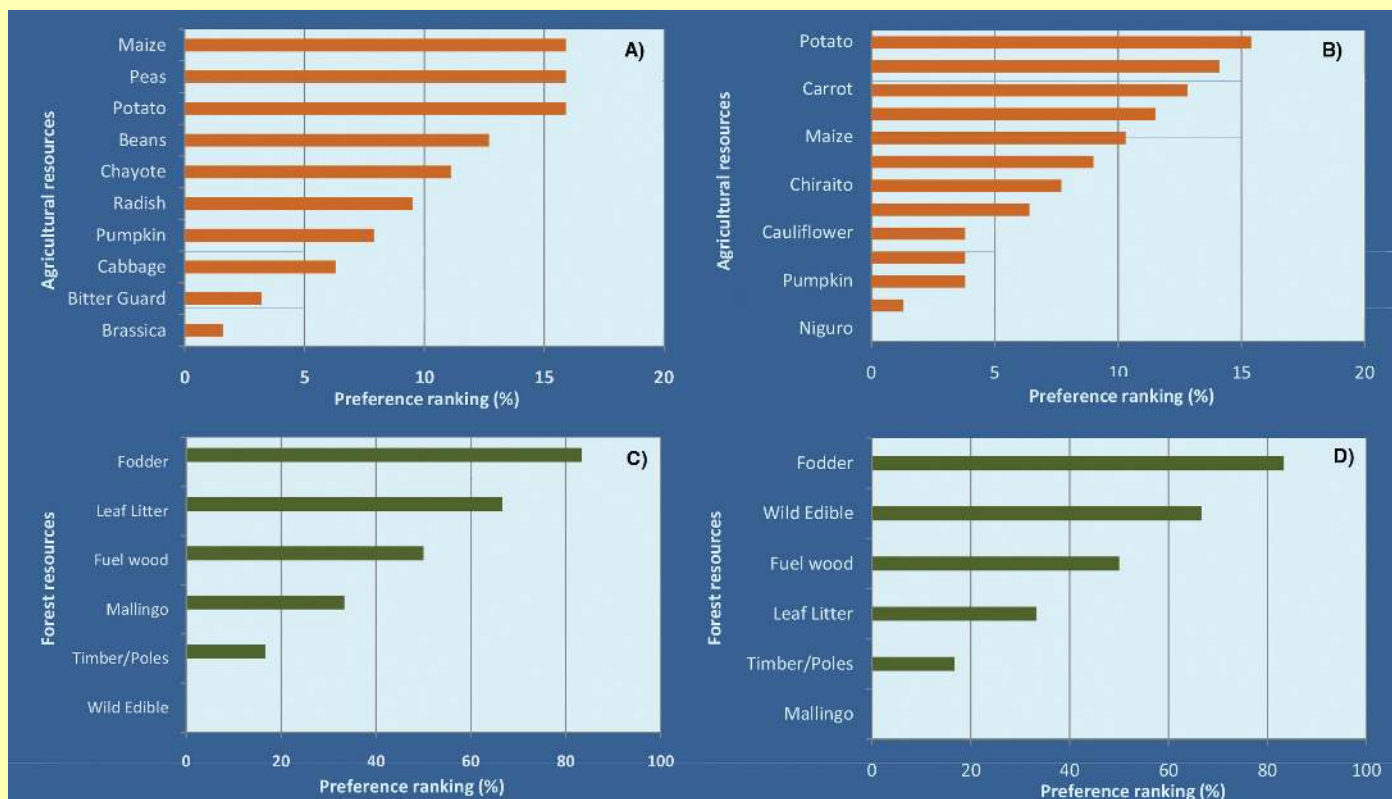
Sub-Alpine meadows of Barsey-Singalila site commands view of series of mountain ranges culminating in four of the five world's highest peaks such as Mount Everest, Mt. Lhotse, Mt. Makalu and Mt. Khangchendzonga



Resource map of Ribdi-Bhareng village (Barsey-Singalila Site) prepared during Participatory Rural Appraisal (PRA) study by the team of GBPIHED, Sikkim Unit and TMI-India, Gangtok with the help of local people (informants)

Resource Use Patterns in Barsey-Singalila Site

Pair wise ranking was used to assess the degree of dependency of community people on the agricultural and forest resources during Participatory Rural Appraisal (PRA) in the villages of Gorkhey and Ribdi-Bhareng. According to local people (informants), Maize, Peas and Potato are the major preferred crops in Gorkhey village, while for the villagers of Ribdi-Bhareng, the Potato, Cabbage, Carrot and Radish are the preferred crops. Regarding wild resources, the people depend on the forests, especially for fodder, leaf litter and fuel-wood collection. Dependency on the forest for fodder is highest, because most of the village people own livestock, and the fodder collection becomes a primary need in either villages. Also, the collection of wild edibles is more frequent in Ribdi-Bhareng village as compared to Gorkhey, for their higher use and resource availability.



Resources use pattern in Barsey-Singalila Site, i.e. agriculture resources in A) Gorkhey (Darjeeling, West Bengal) and B) Ribdi-Bhareng (West Sikkim), and Forest resources in C) Gorkhey (Darjeeling, West Bengal) and D) Ribdi-Bhareng (West Sikkim)

Forces influencing socio-economics

Supporting forces	Opposing forces
<ul style="list-style-type: none"> ❖ Centre place for the tourist ❖ Rich floral and faunal diversity around the village ❖ Organic Farming ❖ Availability of water resources ❖ Unity among different community groups ❖ Eco-tourism destination ❖ Active women participation 	<ul style="list-style-type: none"> ❖ Weak transportation and electricity, and poor telecommunication networks ❖ Human wildlife conflicts ❖ Limited livelihood options ❖ Lack of health, education, market, bank and other resources ❖ Weak functioning of local community groups, and high out migration ❖ Inadequate eco-friendly manures ❖ High dependency on forest resources

Barsey-Singalila site has been identified as a potential pilot site in KLCDI-India for implementing the KLCDI programme, due to its *i) richness of biodiversity, ii) dependency on agricultural and forest resources, iii) fragmented transboundary complexity, iv) eco-tourism potential, v) organic farming opportunity and vi) promising women participation*. These suggest necessity of implementing the appropriate activities for sustainable conservation and management of the biodiversity and livelihood improvement.

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KLCDI, India programme

Guiding Agency: Ministry of Environment, Forests & Climate Change, Govt. of India

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