People's opinion on the Impacts of "Ban on Grazing" in Barsey Rhododendron Sanctuary, Sikkim, India

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Sunrise on Mt Khangchendzonga, the guardian deity of Sikkim as seen from Barsey

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The Mountain Institute

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Background

1. The Himalaya is the youngest of the world's mountain chains and has amongst the highest peaks in the world. These mountains form the watershed for most of the rivers flowing in Northern India, which sustains millions of humans who inhabit the Indo-Gangetic plains. The Himalayan region including the Himalayas and the Trans-Himalayas cover ca. 12% of the countries 3.3million sq. km. geographical area in the five states of Jammu and Kashmir, Himachal Pradesh, Uttaranchal, Sikkim and Arunachal Pradesh. At present about 4.7% of the countries 3.3 million sq. km geographical area is under the protected area network. The protected area network in the Himalayas and Trans Himalayas consists of 15 national parks and 60 sanctuaries covering 37,479.24 sq. km. (based on data available in the National Wildlife Database of the Wildlife Institute of India)

2. There are important conservation issues in the Himalayas and Trans Himalayas today. Human landuse is pervasive in this landscape. Most of the national parks that presently exist have problems, and in many, adequate management machinery is yet to be established. Though large sized protected areas have been designated, the status of wildlife conservation within them is rather poor. Not a single protected area is free from livestock grazing and other forms of human use. The entire region undergoes pastoral and agro-pastoral landuse and the livestock population is growing. Many rangelands are overstocked. This has resulted in competition between livestock and wild herbivores, and many wild herbivore populations have consequently got depleted and even gone locally extinct. There have been few attempts to evaluate livestock grazing impacts on native wildlife. Consequently, the debate on what kind of impacts local human resource use have on native wildlife remains ill-informed. The debate on whether local human use of wildlife reserves should be modified, curtailed or encouraged continues to be fuelled by activism rather than by ecology (Mishra & Rawat 1998).

3. Owing to high seasonality and low primary productivity, the Himalayan region supports relatively low ungulate herbivore biomass. It is therefore, obvious that with the increase in the biomass of domestic livestock in many areas, wild ungulates have suffered competitive exclusion. Rawat (1998) has pointed out that several areas in the Himalaya there is an overstocking of livestock leading to decreased productivity and degradation of pastures. Although animal husbandry is one of the main stay of livelihood in the Himalayan region, the management of livestock especially disease surveillance, rotational grazing and pasture management have been neglected leading to conflicts with wildlife as well as PA managers have either resulted in local extinctions or very low densities in many areas (Rawat & Satyakumar 2002).

4. The Barsey Sanctuary is a part of the larger Khangchendzonga ecosystem, which is the third highest in the world, and is a part of the Eastern Himalayan Conservation landscape including the Khangchendzonga Conservation Area in Nepal, Khangchendzonga Biosphere Reserve, Barsey Rhododendron Sanctuary and Maenam Wildlife Sanctuary in Sikkim and Singalila National Park in West Bengal, India. This landscape has east-west and north-south connectivity with the other protected areas in Nepal, Sikkim and West Bengal in India and Bhutan. It provides the headwaters environment for many of the major river systems. Seven rivers - Tista, Rangit, Torsa, Mahananda, Neora, Tamur and Sapt Koshi originate from here and what takes place in the upper watersheds has far-reaching effects on downstream areas.

5. Sikkim is listed among the world's ten most critical centres for biodiversity and endemism. Sikkim is widely acknowledged as India's most significant biodiversity "Hot Spot" with a bewildering density of biodiversity in just 0.2% of the geographical area of the country. It harbours 4500 species of flowering plants, 11 species of oaks, 9 species of conifers, 9 species of tree ferns, 550 species of orchids, 362 species of ferns and its allies, 484 species of medicinal plants, 30 species of primulas, 20 species of bamboos and 175 species of wild edible plants. The faunal wealth consists of about 144 species of mammals, 550 species of birds, 600 species of butterflies, 33 species of reptiles, 16 species of amphibians and 48 species of freshwater fishes (Lachungpa *et al*, 2003).

6. The Barsey Rhododendron Sanctuary notified in 1996, lies in the southwest corner of the West Sikkim district. Spreading over 104 sq. km, across the razor sharp Singalila Range, which forms the natural international border with Nepal. In the southern boundary the Rambong Khola separates it from West Bengal. The bridle path from Hilley to Barsey is a favourite amongst tourists especially during the Rhododendron flowering season.

7. The altitudinal gradient of 2200m – 4100m provides for a wide range of micro climates, leading to a vast floral diversity. Right from the Sub Tropical forests to the rolling Alpine Meadows. These diverse forest types in turn shelter a wide range of faunal elements. This sanctuary was created to protect the magnificent Rhododendron forests, along the Singalila ridge which is the flagship species here. The climate being essentially wet and cold is ideal for the propagation of this genus. This climate also

fosters a mind boggling variety of epiphytic orchids, pteridophytes, mosses, lichens, and invertebrates.

8. The temperate and alpine forests of oak, hemlock and fir loaded with epiphytes like ferns, moss, lichens, orchids etc support a wild variety of fauna like the Red Panda, Himalayan Black Bear (*Bhalu*), Barking Deer (*Mirga*), Yellow Throated Marten (*Malsampra*), Goral, etc. The under storey of dwarf bamboo and Rhododendrons serve as a habitat for the State Animal of Sikkim – The Red Panda and pheasants. This sanctuary is also extremely rich in various medicinal plants. including Bikhma (*Aconitum sp.*), Pakhan bed (*Bergenia ligulata*), Chimping (*Heracleum nepalense*), Panch Aunle (*Orchis latifolia*), Siltimbur (*Litsae citrate*), Kutki (*Picrorhiza kurrooa*), Har Jur (*Viscum articulatum*), *Taxus baccata* etc.

9. In mid 19th century, Sir J. D. Hooker the world renowned botanist noted in his diary, "The Shingalila Range, forming the political boundary between Sikkim and Nepal, springs from Kanchendzonga and extends southwards to the plains of Bengal. The super abundance of rhododendrons is the glory of the Shingalila Range. The banks of rivers between 8000 and 14000 feet are generally covered with Rhododendrons sometimes to the total exclusion of other wooded vegetation, especially near the snowy mountain, a cool temperature and great humidity being the most favourable conditions for the luxurious growth of this genus. Such conditions prevailing throughout the Shingalila range due to its proximity with the Kanchendzonga range. The silver fir extends to 13,000 feet and the junipers to 15,000 feet. Where the former is only a small, stunted, weather worn tree, the other, a prostrate, intricately branched shrub. For many miles the path runs through woods of *Rhododendron arboreum, R. cinnabarinum, R. falconeri, R. barbatum, R. campanulatum,* and *R. hodgsoni, Acer caudatum, Betula utilis, Pieris ovalifolia, Prunus rufa, Pyrus foliolosa, Pyrus macrophylla* etc. Here also are seen the last examples of the dwarf bamboo tribe, *Arundinaria spathiflora* and *Arundinaria racemosa*."

10. It is also the catchment for the life giving rivers like Kaleej khola, Ringyang Khola, Rambong Khola, Dentam Khola, Begha Khola, Sungure Khola and many smaller streams. Conserving this water reservoir is essential for the survival of thousands of villagers who live at the lower elevations. Improved ecological health of these forests translates to sufficient water in the streams even in the lean season, which in turn results in bumper harvests of Large Cardamom, Rice, Potato, Peas and other agricultural and horticulture crops, directly translating to food and health security of the villagers living down stream.

11. The main cause of concern voiced by the villagers was the drying up of the perennial drinking water sources due to the destruction of forests by the herders and their cattle. The intensive, localized collection of firewood and fodder from the forests adjoining these cattle sheds has caused immense damage to the forests.

12. The requirement of a field study jointly with the Forest Department in collaboration with the Ecodevelopment committees and NGO's was felt to explore and document the process, problems faced, lessons learnt and impacts of this grazing ban in Barsey Sanctuary.

Objectives

1. To assess the pastoralism systems prevalent in Barsey Rhododendron Sanctuary
2. To document the process adopted to phase off the herders and the impacts
3. To document the perception of the people about making Barsey "cattle free"
4. To explore feasible livelihood options for the herder community

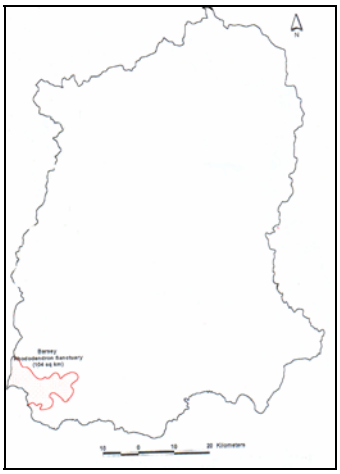
Survey Methods

1. The study tried to answer the following questions:
    a) Whether the pastoralism was a traditional activity or not?
    b) Why only certain households opted for the pastoralism livelihood?
    c) What was the economics of pastoralism?
    d) Why did the herders agree to shift out from pastoralism?
    e) What did they do with the surplus cattle?
    f) What is the new livelihood strategy of the herder household to recover the lost incomes from pastoralism?
    g) What are the perceived benefits to the herder household from shifting out of pastoralism?
    h) What is the perceived loss to herder household from shifting out of pastoralism?
    i) What is the perceived benefit to the wildlife habitat due to this?
    j) Given a chance will the herder still prefer to go back to pastoralism?
    k) What are the feasible livelihood options for the herder community now?

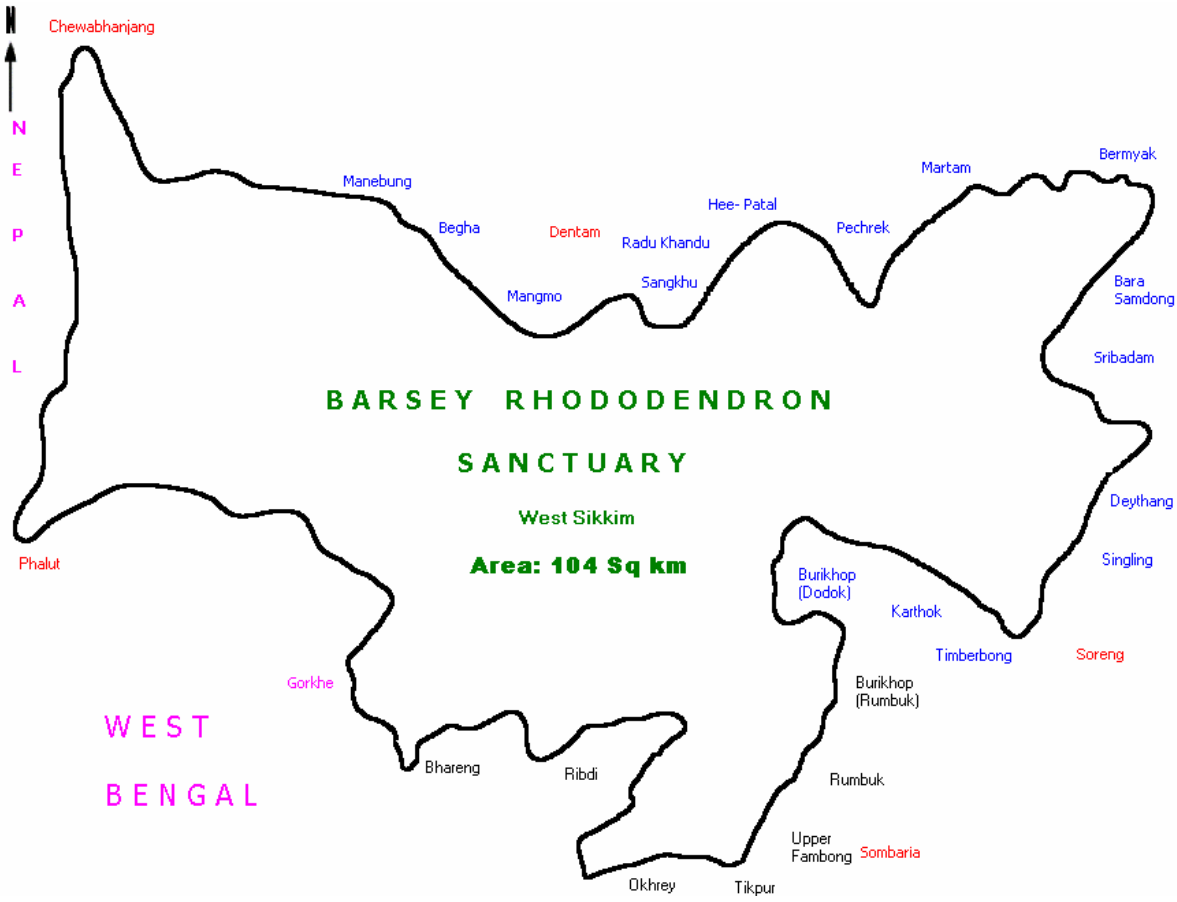
2. During the initial meetings with the Forest Department it was stressed that the focus of the study should be to document the perception of the people. Accordingly a semi-structured "herders household questionnaire" form was prepared.

3. A consultation workshop with the herders, Eco-development Committee and Forest Department personnel was organised at Soreng on 21st February, 2005 to finalize these questions and also to fix the dates for the village visits. In this workshop it was decided to cover all the 8 EDCs of the sanctuary covering 30 villages and have a detailed discussion with atleast 10 herder's in each EDC, along with the views of the EDC members. After completing this village-based survey, it was also decided to have a joint field visit inside the sanctuary to inspect the sites where the cattle sheds used to be there previously. A total of 80 herder households of the total of 288 in the 8 EDCs (sampling intensity of 28%) along with all the 8 EDC presidents were surveyed during the course of this study. The EDCs also assisted the project assistant

Village Map of Barsey Rhododendron Sanctuary



Sikkim State



Perception of the ex-herders being recorded

Consultation workshop with Forest Department personnel, Ecodevelopment Committees and ex-herders to finalize the process of this study

during the village and field surveys. An audiovisual documentation of the above survey at select locations was also carried out.

4. After completing this survey a final consultation workshop was organized in Barsey Sanctuary on 27th April, 2005 which was attended by all the 8 EDC presidents where they shared their experiences in making the Barsey sanctuary "cattle free", as well as their vision and dream for the future.

Observations

Past

1. There are 36 villagers, 6,456 households with a total population of 37,267 (as per the Census of India, 1991) residing adjoining to the Barsey Sanctuary who practise subsistence level mixed farming systems. Production from single cropping on hill slopes was limited and since market prices were also low, the incomes from farming were less. The cow herders were from all the adjoining villages, sheep herders were from Begha village and the yak herders from Dentam and Uttarey. The current study focuses on the cow herders which formed an overwhelming 94% of the total herders in the sanctuary.

2. The villages especially those in the forest fringes that had easy accessibility to reserve forests depended upon forest for fodder, wood and NTFP. As on 2000 about 4% of the household in the village, who had limited cultivable land, preferred pastoralism since their incomes from agriculture were not sufficient. The average land holding of the herder households was 2 acres. It was observed that agro-pastoralism was a traditional and hereditary occupation. The main reasons behind opting for pastoralism was better incomes, traditional occupation and also limited land holdings.

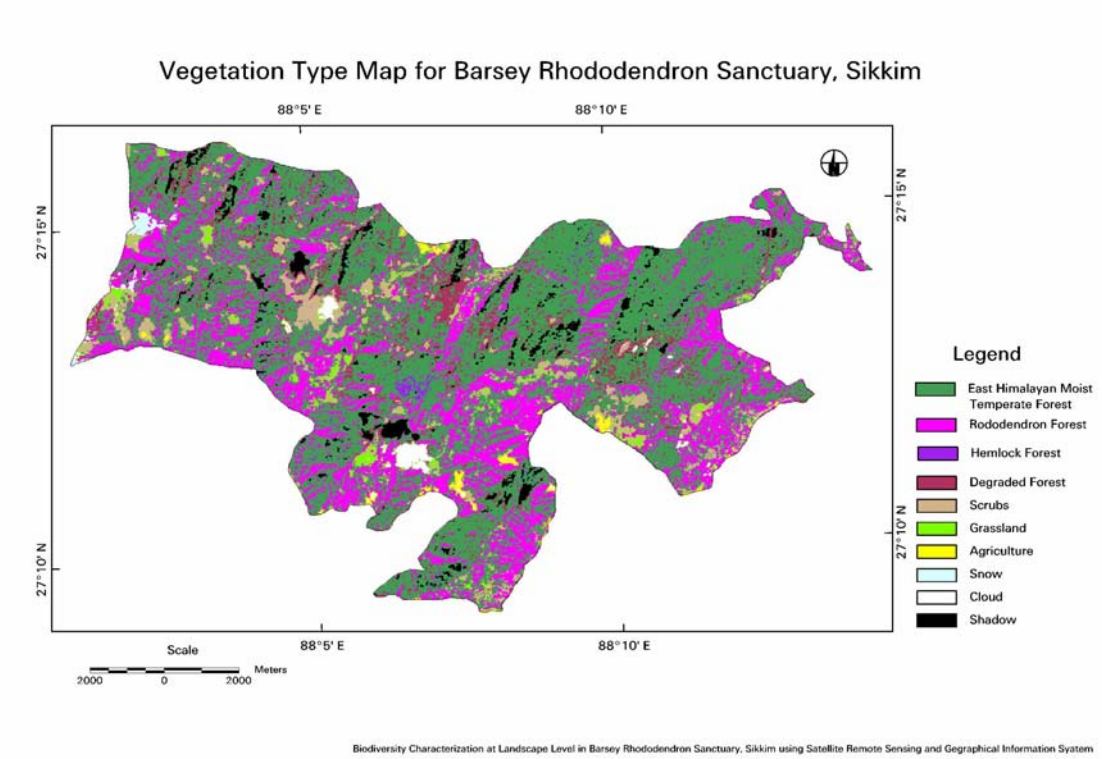
3. In the year 2000 there were a total of 288 households practising pastoralism within the Barsey Sanctuary. They owned 5,370 cows, 370 buffaloes, 506 yaks and 135 sheep which grazed within the sanctuary throughout the year. The livestock density was 61 livestock / km^2 and the cattle shed density 4.5 / km^2. By 2005, 276 of these herders (272 cow herders, 1 yak herder and 3 sheep herders) have phased out from this profession. Of the 12 herders still remaining, 10 are yak herders and 2 are cow herders. Of the total 6,324 livestock units grazing within the sanctuary in the year 2000, there has been a 93% reduction and by 2005 only 463 livestock units remain. The livestock density has reduced by 96% from 61 livestock / km^2 in 2000 to 4.45 livestock / km^2 in 2005. Similarly the cattle shed density has also reduced by 96% from 5.54 cattle shed / km^2 in 2000 to 0.23 cattle shed / km^2 in 2005. As the figures indicate a cattle sanctuary has been now slowly converted in to a safe haven for wildlife.

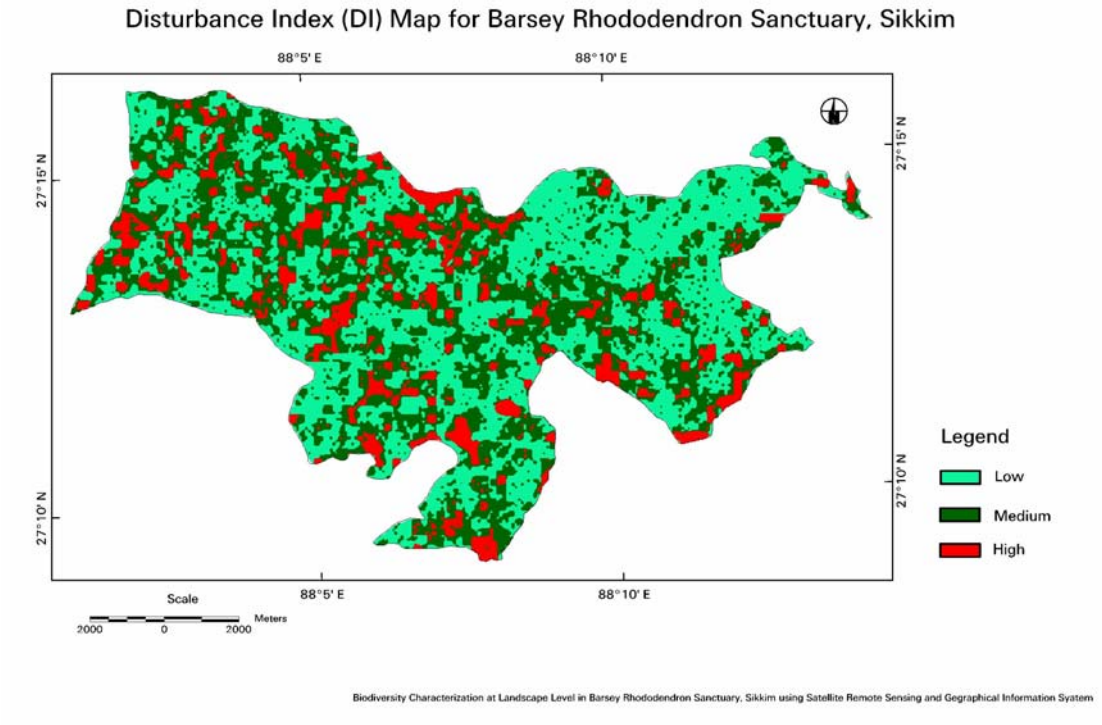
Cattle shed (*goth)* in the oak forests of Barsey Rhododendron Sanctuary

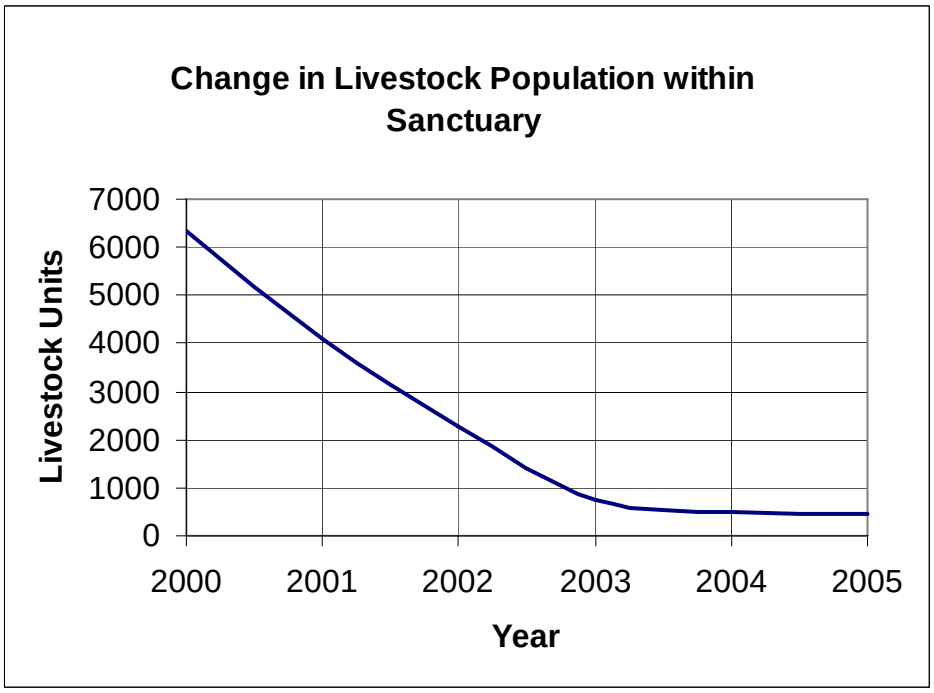
Cattle shed (*goth)* in the conifer forests of Barsey Rhododendron Sanctuary

Over grazed areas dominated by thorny shrubs of *Berberis, Rosa* and *Viburnum*

Study carried out by Indian Institute of Remote Sensing, Dehradun characterizing the vegetation and disturbances in the sanctuary based on satellite imagery of February 2002.







4. These graziers belong to the adjoining villages, and their agility and speed over this treacherous, rugged terrain is unmatched. They possess tremendous traditional knowledge about this land and its natural resources. These men and women make little of the hardships that they face in this inhospitable terrain. And are most gracious in welcoming a trekker with a steaming cup of salted butter tea and curd.

5. The cows are milked twice, and a better part of the day is spent in churning the milk for Butter (*Gheu*) and curdling and smoking it for Hard Cheese (*Churpi*). Butter and hard cheese are the two main marketable items of this dairy trade. These are sold in the local bazaar (*haat*) mostly through a middleman. The average cattle ownership per family being around 21 cattle units. Butter and cheese are their only marketable products. It is also believed that the cows are healthier and also multiply quicker when they are left free in the forest. They earn about 30% of their annual income from sealing ox, and calf. In the past their annual average income was Rs. 28,000/- per household.

6. Literacy rate amongst the herder families was very low, and most of the herders were illiterate. 75% of the male herders and 91% of their wives had never been to school; in fact some of them had been born and bought up in the forest. The semi nomadic lifestyle prevented their children from accessing school and also they were not encouraged to attend schools and consequently their literacy rates was found to be low, leading to less scope for employment. Very few children of these herder's have completed their studies and are recruited to jobs (6 children from 80 herder households are in low grade government employment as of April 2005). Pastoralism also made them to stay in remote isolated areas, all alone, and hence their social development was also found to be low.

7. The main reason why the 10 yak herders have not yet been phased off is since they are located in remote, high altitude areas, away from villages near the international border with Nepal.

Impacts of Pastoralism

8. The area around the cattle shed was totally barren due to trampling and over grazing. Hardly any healthy tree could be found in about 1ha of land adjoining to the cattle shed. In 2000 there were a total of 288 herders, and on an average each herder had 2 cattle sheds within the sanctuary. So a total of 576 ha of land was made barren.

9. The herders needed pole size timber of trees like *Viburnum erubescens* (Asarey), *Symplocos theifolia* (Kharane), *Tsuga dumosa* (Thengrey Salla) and *Symplocos spicata* (Kholmey). These plants were used as a pole for constructing the cattle shed, the herder needed on an average 72 poles for repairing his cattle shed every year, on an average with 2 cattle sheds per herder, this amounts to 144 poles per herder per year amounting to 41,472 poles per year. At the village rate of Rs 10/pole the annual economic value of amounts to Rs 4.00 lakhs/year.

10. It gets quite cold at these altitudes and firewood is the only source of energy. The preferred species were *Quercus pachyphylla* (Bante), *Quercus lamellosa* (Buk), *Machilus sp.* (Kawla) etc. The herder used about 62 kgs of firewood daily (2 head loads) for cooking, heating and lighting purposes. The average annual requirement of firewood was 22 metric tonnes. At the village rate of Rs 30/headload of firewood this amounts to an economic value of Rs 41 lakhs/year.

11. The fodder requirement during summer / monsoon was from Dwarf bamboo, ground fodder, and tree loppings of mostly Acer sp. (Kapase), *Quercus lamellosa* (Buk), Machilus sp. (Kawla), *Litsaea sp.* (Pahenle). During the lean season (winter) when there is a scarcity of ground fodder, Dwarf bamboo *Quercus pachyphylla* (Bante), *Quercus lamellosa* (Buk) and *Schefflera impressa* (Bhalu Chinde) form the main fodder base. The average daily requirement of fodder was 76 kgs (3 head loads), with the average annual requirement being 26 metric tonnes. At the village rate of Rs 20/headload this amounts to Rs 45 lakhs/year.

12. The total average annual biomass requirement for 288 herders amounts to 6,336 metric tonnes of firewood, 7,476 metric tonnes of fodder and 41,472 pole sized timber. The value of this biomass in the village market is Rs 30/headload of firewood, Rs 20/headload of fodder and Rs 10/pole. Using these village rates, the economic value of this biomass amounts to Rs. 90 lakhs per year.

Process of phasing off livestock

13. In the Sikkim State Biodiversity Strategy and Action Plan in which 8 public hearings were organized in the villages adjacent to the Barsey Sanctuary, removal of these herders was accorded “high” priority in all these meetings by the villagers especially by women. At the public hearing held in Hee Patal village held on 20th July, 2001 on being asked why the forests have got degraded and what needs to be done now, the

women had this opinion, “There are permanent cattle sheds [Goths] in the forests. They need to be removed first, once this is done, habitat improvement in the form of dwarf bamboo thickets of Malingo and Pareng will regenerate automatically. These Gothalas (herders) are not poor, and have the same economic status as all of us. Some of them are even from other villages and they come here due to availability of water and good forests. These herders also indulge in hunting and trapping of wild animals, and keep local made guns. Availability of medicinal plants has reduced drastically since their cattle graze them. Due to this competition from livestock, even wild animals have become scarce.”

14. As per the legal standpoint all the reserve forests, sanctuaries and national park of Sikkim are free from any rights and concessions. Pastoralism and the associated firewood, fodder and poles collection was in violation of Section 20 of the Sikkim Forests, Water Courses and Road Reserve (Preservation and Protection) Act 1988 and Section 29 of the Wildlife (Protection) Act 1972. Also it is in contempt of the judgement of the Hon’ble High court of Sikkim delivered on 14/05/1999 and the Hon’ble Supreme Court in its WP No 202/95 dated 14/02/2000 has “restrained states from ordering even the removal of dead, diseased, dying or wind fallen trees and grasses from national parks and sanctuaries. As per the orders of the state government and the wishes of the people the Forest Department has been issuing notices and trying to phase out these cattle sheds since 2000.

15. 99% of these herders have indicated that it was only fear of enforcement of forest and wildlife laws that ultimately compelled them to shift out of the sanctuary. The Forest Department employed a carrot and stick approach. Prior notice was given to all the herders and the concerned Panchayats explaining the negative impacts of the herding livelihood and requesting for their cooperation.

16. Awareness programmes, audio visual shows, street plays and nature games were also organized regularly in coordination with Local NGO’s like Khangchendzonga Conservation Committee (KCC). In 2001 in order to empower the villagers and institutionalize their role in planning and decision-making, Ecodevelopment Committees (EDCs) were formed. The villager elders, local NGO’s, panchayats and school teachers were all involved in the EDC. Microplans were also prepared in a participatory manner.

17. The total forest personnel of the Barsey Sanctuary numbered 10, including 2 casual workers, 4 forest guards, 2 block officers (foresters), 1 range officer and 1 divisional forest officer. At times even the peon and the driver of the division were pressed into field duties. The newly formed Ecodevelopment Committees played a vital role in this initiative. For four years non-stop they campaigned in the village and lead this revolution of convincing the herders to shift to sustainable livelihoods.

18. The main reason why the EDC was so active and influential in garnering popular support for this initiative was the Ecodevelopment policy of the state, which

Negotiation workshop with herders organized by the Forest Department at Burhiakhop, West Sikkim in December 2000

Street Play organized by the Forest Department to raise environmental awareness at Dentam, West Sikkim

Strict enforcement of wildlife laws by trained forest guards inside the sanctuary

Herders who had voluntary phased off their cattle receiving financial assistance from the Ecodevelopment Committees at Soreng, West Sikkim

Ex-herders exploring trekking tourism opportunities in Barsey Sanctuary in 2004 jointly with the PCCF cum Secretary, Forest Department, Mr. T. R. Poudyal and the MLA Mr. N. K. Subba amidst bountiful grass growth

envisaged a paradigm shift aim in institutionalising the stake of the local communities for the conservation and development of the sanctuaries and national parks. Even legal powers for apprehending forest offenders were given to this committee. The EDC was also given legislative powers wherein they were empowered to prepare a "Code of Conduct" for their area in consultation with the Gram Panchayat, whereinguidelines for conservation are made in consultation with the Gram Sabha and penalties also laid down incase of non compliance to this code of conduct.

19. In short conservation efforts were initiated right at the grassroots. In the words of Mr. Nuri Sherpa President of Ribdi EDC, "Earlier the forest officers used to patrol the forest above our village occasionally and then return. Once they were gone the villagers used to indulge in illicit felling of trees. It was difficult to nab these offenders as no forest staff was permanently posted in our village. Now with the formation of the EDC in our village, the villages now know that their own fellow villagers can also now nab them. They are worried that now they have voluntarily tied their own hands."

20. For those who phased off their cattle voluntarily and in a timely manner, the government assisted in purchasing their surplus cattle, also a one time financial assistance of Rs 10,000/household was also provided. This helped in reducing the short term hardships faced by the herders due to this livelihood change. For those herders who did not phase of their cattle sheds, strict enforcement of Wildlife Protection Act 1972 was carried out, forcing them also to shift out.

21. There was strong political will from the greenest Chief Minister Dr. Pawan Chamling to convince the herders to shift from herding large numbers of less productive cattle to limited numbers of productive cattle. In all his speeches, interaction with the villagers and party functionaries he insisted on implementation of this state policy. This strong support from the top executive of the state facilitated the Forest Department and the EDC's in phasing off of the unproductive cattle of the herders. In an increasingly democratized world where restoring wilderness to wild lands does not make good political sense, the results of this case study demonstrate the importance of a strong political will for nature conservation.

22. The barren land adjoining to the cattle sheds has been taken up under a massive afforestation drive by the Forest Department through the EDCs since 2003.

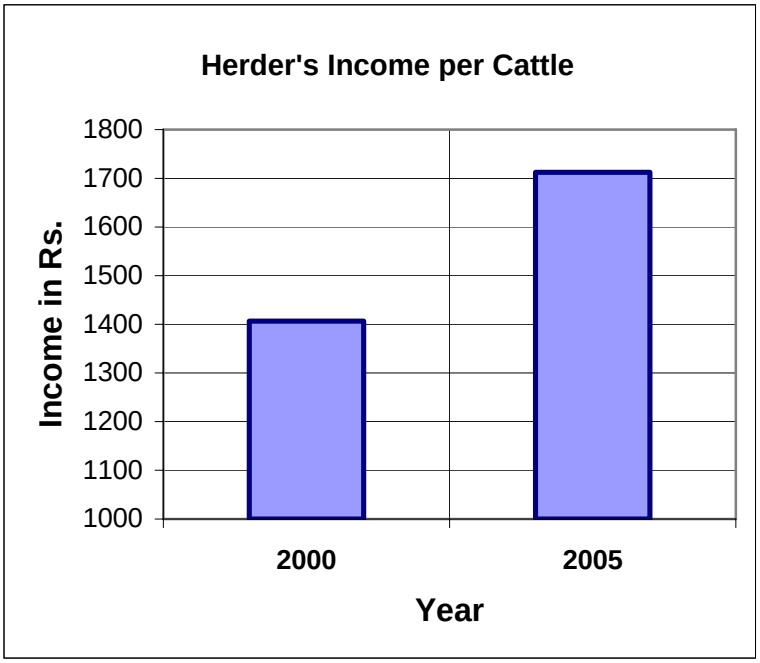
Impacts after Phasing off herders

23. The herders had to face hardships after phasing off from pastoralism, as they were not aware of what to do next, so they started gaining momentum towards new livelihood strategies. This hardship has given them the opportunity to build their strength in other similar sectors, like some have started their own private dairy; they have started putting additional effort in farming. Most survive with income earned form home dairy, agricultural income and labour work. Some have taken additional land on lease and some have moved towards business sector as well.

24. It was not possible for the herders to tend to 20-30 heads of cattle in their own land holding, since there was a fodder scarcity and also there was a scarcity of land. Consequently they were forced to sell of most of the cattle in the local market, and keep only about 2-3 good quality cows under stall fed conditions in his farm. The income per cattle has gone up by 22% from Rs 1,407/cow while grazing in the forest in the past to Rs 1,713/cow in the stall fed conditions at present. On an average a herder earned a one time income of Rs 33,900/- from this cattle sale. The income source of the herders has diversified from solely pastoralism earlier to dairy farming, agriculture, casual labour and business now. At present on an average each herder household earns an average of Rs 4,950/- per annum from dairy products and Rs 3,890/- from farming and Rs 8,836/- from other sources like casual labour, business, salary etc. 94% of the herders have not been able to earn as much as they used to during pastoralism, the average loss in annual incomes for a herder as on April 2005 was Rs18,173/-.

25. 91% of the herders perceive some positive benefits also from leading a settled life in the village. They now have a better social life, their farms have a better availability of manure and also their children now have access to formal education.

26. However the negative economic impacts from reduction in incomes far outweigh these social benefits. Among the 80 herders surveyed, 34 households insisted that they would not return to pastoralism even if given the chance since they had become old, they had becomes environment conscious and they could no longer take the rigors of this physically tough lifestyle. However the remaining 46 herders are still keen to revert back to pastoralism if given a chance, since this would result in better incomes due to the availability of free and abundant fodder and firewood in the sanctuary.



27. The positive impacts on the wildlife habitat of Barsey Sanctuary as perceived by the herders is better natural regeneration of natural forests, more biomass availability, rejuvenation of springs and increase in wildlife populations. With the conservation of biomass, ground cover, leaf litter, humus and dwarf bamboo undergrowth the forest cover has improved remarkably. This has resulted in the revival of many existing mountain springs, like at Deorali, Phanglakha at Bermiok Martam, Ribdi, Hee Patal and Sribadam. This spring water currently meets the drinking water needs for many adjoining villages.

28. The population of wild animals has also increased specially that of Wild Boar and Barking Deer. Even the Common Leopard which was not reported for more than 26 years has made a comeback with 2 sightings over the last one year.

29. Recognizing this contribution in preserving the unique Oak and Rhododendron forests of Barsey Sanctuary, by motivating the villagers to phase out their cattle and cattle sheds within the forests. And helping in spreading the dream of a clean and green environment with people's participation and institution building of the newly formed Ecodevelopment Committees and Joint Forest Management Committees. The conscious citizens, nature lovers, Panchayats and public of Hee Bermiok constituency conferred on the forest department personnel a "green certificate" on the occasion of the annual day school function of Bermiok Martam Secondary School, West Sikkim, which was awarded by the chief guest of the function, Hon'ble Chief Minister of Sikkim Dr. Pawan Chamling and Shri N. K. Subba, Hon'ble Area MLA, 5 Hee Bermiok Constituency.

Revival of the mountain spring source at Phanglakha, Bermiok Martam

Forest personnel receiving the "Green Certificate" from the greenest Chief Minister – Dr. Pawan Chamling

Conclusions and Recommendations:

1. The success of the model employed by the Forest Department lies in the diverse strategy adopted to conserve the biodiversity of the Barsey Sanctuary. This included strict law enforcement coupled with grassroot level awareness programmes, institution building of the EDCs and empowering them, providing financial assistance to the herders who voluntary phased off their cattle and working jointly with the local NGOs. This coupled with political will from the policy makers of the state resulted in a win win situation.
2. In order to ensure that the gains from this initiative are sustainable and the ex-herders do not revert back to their earlier occupation, it is imperative that the following steps be taken up urgently.
    - The livestock units within the sanctuary have decreased by 96% over the last five years. The villagers want the forest department to assist in phasing off the remaining 4% livestock (mostly yaks) also. Also they have raised the issue of why the Forest Department is using different yardsticks for cows and yaks?
    - The ex-herders have requested livelihood support for procurement of good quality milch cow, improving their personal cattle sheds, providing them with good breeding bulls, setting up of a village dairy, providing market linkages for sale of dairy products, capacity building and exposure visits to dairy farms in the region. Also they have requested support to improve the incomes from agriculture, providing skills in ecotourism enterprise and quality education for their children. Providing livelihood support at this stage can have a great impact and can motivate them towards other

sustainable livelihoods. If these ex-herders are given priority in the ecodevelopment and forestry schemes of the Barsey Sanctuary it will provide them with the necessary livelihood support at this crucial juncture.

3. The villagers also desired institution building of their village level NGOs, CBOs and self-help groups to strengthen them to take up village level development work.
4. The Ecodevelopment Committees of the Barsey Sanctuary lead this green revolution at the village level. Their selfless, voluntary contribution and sacrifice needs to be appreciated and recognized.
5. Promotion of regulated trekking-tourism in Barsey Rhododendron Sanctuary will provide income and employment opportunities to the villagers in a long run. The ex-herders have tremendous knowledge about the sanctuary and its forests. If this resource can be tapped and coupled with capacity building then they can become valuable nature guides and resource persons for their village and act as stewards for this sanctuary.
6. "The woods are lovely dark and deep,
   But we have promises to keep,
   And miles to go before we sleep
   And miles to go before we sleep."
   The forest department needs to run this last lap hand in hand with the ex-herders to emerge joint winners in this green revolution.

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