

265. Conservation Governance and Policy Monitoring of Ecologically and Economically Significant Gymnosperms in North Sikkim Himalaya

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Abstract. Environmental Conservation address environmental policy, practice, natural and social science at the global level. IUCN has recognized Teesta river basin, harbouring the elegant Gymnosperms in Sikkim as a part of Indo-Burma hot spot. Gymnosperms carry immense ecological, economical, and evolutionary, importance. Present proposal aims to make a study in Northern Sikkim (Lachung, Yumthang, Sevo, Lachen, Yakthang, Kalep and Thangu) for the planning of environmental conservation and management of the 18 species of Gymnosperms. Our main objectives includes, review policies on natural resource management and land-use; Analyse social, economic, and environmental issues and develop a framework of joint action between institutions.

Keywords: Environmental conservation, Gymnosperms, North Sikkim, Natural resource management

Introduction

Biodiversity is the product of spontaneous evolution during million of years. The concept of diversity relates to the species richness in the community. Biodiversity depends upon the intensity, predictability and scale of these interactions and essential biodiversity services to humans with traditional knowledge drive the phenomenon called “life” (Chandra et al., 2010; Obute, 2010; Suleiman et al., 2010).

Environmental Conservation address environmental policy, practice, and natural and social science of environmental concern at the global level including issues of ecosystem change, resource utilization, terrestrial biomes, aquatic systems, and coastal and land use management. Community-based natural resource management (CBNRM) has been a pervasive paradigm in conservation circles for three decades. Despite many potentially attractive attributes it has been extensively critiqued from both ecological and sociological perspectives with respect to theory and practice (Baral & Stern 2010; Berkes 2004; Blaikie 2006). In focusing on the word ‘management’ there is very little research into situations where communities are the management agencies (Downsborough et al., 2010; Ashenafi & Leader-Williams 2005; Ko et al., 2010).

Gymnosperms in reference to North Sikkim

Teesta river basin in Sikkim (234 m to above 8,598 m); has deep valleys and ravines to gentle slopes in glaciated valley floors in north making it rich in floristic diversity. IUCN has recognized this region as a part of Indo- Burma hot spot. It also provides habitats and acts as a cradle for speciation and evolution of new species along with the genetic improvement of the cultivated species. The region also harbours the elegant Gymnosperms which are still less researched or untouched aspect in particular line of investigation.

Gymnosperms carry immense ecological, economical, ornamental evolutionary, industrial (aromatic, soap, perfumes, household sprays, floor polishes and insecticides, antifungal and clearing oil) and medicinal importance (bronchitis, asthma, epilepsy, snake bites and scorpion stings, aphrodisiac, induce perspiration, internal injuries, lung diseases and diabetes, carminative, antispasmodic, remove toxins from the bowel, increase digestive function and cure skin disorders such as eczema and psoriasis; Earle 2008; Shah et al., 2009; http://en.wikipedia.org/wiki/List_of_herbs_and_minerals_in_Ayurveda).

Globalization has ushered in an era of contrasts of fast-paced change and persistent problems demanding synchronization of national policies on a number of issues. An effective response to these challenges will require fresh thinking, refined strategies, and new mechanisms. Henceforth our research asks key questions: (1) How we can do ex-situ and in-situ conservation of Gymnosperms? (2) In parallel, conservation strategies, to promote economic integration in this regard? (3) What are the challenges that national governments face? (4) What institutional structure is needed to manage interdependence and to maximize the opportunities? An equally rigorous and urgent reform of the environmental governance architecture is imperative. Present proposal is planned to make a study in Northern Sikkim

(Lachung, Yumthang, Sevo, Lachen, Yakthang, Kalep and Thangu) and for the planning of environmental conservation management of the populations of economically and ecologically significant 18 species of Gymnosperms.

The prime objectives for gymnosperms conservation highlight Review policies on natural resource management and land-use emphasizing the gaps; Analyze social, economic, and environmental issues; Develop a framework of joint action between institutions in order to develop protected corridors, taking community participation as the key element; Establish proper priorities in terms of scarce resources allocated wisely in relation to education, or enhanced monitoring and observational systems; Recognize Culture, heritage and social structures in resource management and Enable Markets to work, as the prime land and shelter delivery mechanism.

Methods

Exploration in North Sikkim (Fig. 1). Despite having less forest cover (30%) North Sikkim is at top with respect to the number of flowering plants or number of endemic and threatened species of flowering plants mostly covering the area of particularly in Lachen-Lachung valley and Zemu valley. In recent times, the increase in human population as well as increase in various developmental activities have posed a serious threat to the floristic diversity of Teesta basin.



Fig.1 Locality map in North Sikkim

Analysis and monitoring of policies and institutions for their socio-economic and environmental impact, relating to Gymnosperms belonging to North Sikkim Area

(a) Linking environment and gymnosperms conservation and economic growth

To devise more sophisticated and realistic policy approaches for allocating resources for Sustainable economic growth which is depending on the level, quality, and management of natural resources (R), environmental quality (E), and institutional governance capacity (I).

(b) Priority setting and strategic planning

(i) Assisting partners to more effectively plan strategically and develop environmentally related policy and

institutional governance programs

(ii) Engaging the participation of relevant stakeholders in planning initiatives, including the private sector, with special attention to participation by traditionally under-represented groups, such as women and indigenous people, spiritual or cultural incentives. of policies

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(c) Dissemination of Environmentally Related Policy Knowledge Communications and Research

- Strengthening the governance capacity of local governmental and non-governmental organizations Institutional information dissemination vehicles, including but not limited to, publications, seminars, workshops and the internet.

(d) Policy Analysis and Dialogue Support

- Issue Recognition: Identifying and analyzing policy constraints and opportunities;
- Issue Diagnosis: Analyzing the economic, social, ecological and institutional aspects of alternative policies;
- Issue Design: Analysis of alternative intervention strategies, approaches, and incentives or dis-incentives

- to change behavior.
- (f) Policy Performance Monitoring and Evaluation
 - Assisting partners to design and implement policy program monitoring and evaluation activities, both to promote adaptive management and to document results.

Observations

In Sikkim Himalaya, a total of 18 species of gymnosperms are recorded in Teesta river basin. Most of these species are trees except Ephedra sp. and Cycas pectinata, distributed mainly in Lachen-Lachung valley, Thangu region, Yumthang, Dzongri and Chhoka areas (Table 1).

Table 1 Gymnosperms of Sikkim Himalaya (www.sikennis.nic.in/CCSOTB/Vol-VI_Socio- Expected outcome

(Including tentative titles of articles/reports/workshops):					
Species	Family	Ver./Nep.	Alt. (m)	Uses	
Habit	Distribution in			Sikkim	
Cycas pectinata	Cycadaceae	name	600-1050	Shrub	Singtam
					Stem pith used to produce sago
Pinus kesiya	Pinaceae	Thakal	800-1000	Tree	Sangklang
Timber and resin					
P. roxburghii	Pinaceae	Khasia pine	1000-1800	Tree	Rangit and
Tree					Timber; trees tapped for resin
P. wallichiana	Pinaceae	Dhup	Teesta valleys 1700-3300	Tree	Lachung
Timber					
Larix griffithiana	Pinaceae	Dhupi	2600-3600	Tree	Zema,
					Yumthang
Picea spinulosa	Pinaceae	Barge Salla	2400-3000	Tree	Lachen
Timber					
Tsuga dumosa	Pinaceae	She	2400-3000	Tree	Chhaten,
					Lachen, Zema, Chhoka
					Timber
Abies densa	Pinaceae	Tengre Salla	2950-4000	Tree	
					Yathang, Yumthang
Cryptomeria japonica	Taxodiaceae	Gobre Salla	1500-2500	Tree	Damthang, Ravongla
Cupressus comeyana	Cupressaceae	Dhupi	2500-3000	Tree	Rhenok
Timber for dzong					
Thuja orientalis	Cupressaceae	Shing	1600-2000	Tree	Gangtok
Tsendeng					
Juniperus recurva	Cupressaceae	Morpankhi	2900-4200	shrub	Chhangu, Thangu
	Tree/				Twigs and leaves used as incense material
J. squamata	Cupressaceae	Shupo Shing	3200-4700	Tree	Thangu
					Twigs and leaves used as incense material

J. pseudosabina 3500-4500	Cupressaceae Tree/	Shupo Shing		Yumthang, Zema	Wood as incense material
Podocarpus neriifolius	Podocarpaceae	Kaalu Shupo	900-1400	shrub Tree Lower Teesta valley	Timber
			Taxus baccata	Taxaceae 1800-2700 Tree Lachung, Tholung	Used medicinally
Ephedra gerardiana	Ephedraceae	Dhengre Salla	4000-4500	Shrub	Thangu Plant contain ephedrine; used in treatment of asthma and cold
Gnetum montanum	Gnetaceae	Shomlata	270-800	Tree Lower Teesta valley	Timber

- Enhanced capacities for more effective public services delivery to professional skills;
- Sustainable natural growth; increased life expectancy; social protection;
- Improvements to environmentally sustainable economic management especially in rural areas;
- Favorable environment for market development;
- Better plans, management and monitoring of the environment sector;
- Local communities contribute to and benefit from sustainable use of natural resources.

Articles

Traditional knowledge and Conservation of Gymnosperms in North Sikkim.

Novel conservation and policy modeling approaches for sustainable ecosystem and Environmental monitoring.

Development of priority concerns and potential health and education interventions.

Reports (Biannually)

- Conservation Governance and Policy Monitoring of Ecologically, Economically and Evolutionary Significant Group, The Gymnosperms - A Scenario in North Sikkim Himalaya.

Workshops

- Gymnosperms, Population-Poverty-Environment Linkages in North Sikkim.
- Community Based Environmental Management in Lachen – Lachung Valley, The Impacts and Spheres of Influence of the Conservation Program.

Collaborators: Forestry, Soil conservation, Ministry of Enterprise & Employment (MEE). Tourism, Environment & Communications; Economic Planning and Development (MEPD): Population issues, Finance (MoF): Land related Revenue Collection, Information Management; Natural Resources and Energy (MNRE): local NGOs, Universities in Sikkim, BSI Sikkim.

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