



Monastery Forests in Sikkim Himalayas: Ecological Perspectives and Organizational Constraints

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ABSTRACT

The present study was conducted in south and west districts of Sikkim. There are 23 monasteries in South district and 15 in West district, out of which six were selected for the study. The data was collected in two ways i.e., primary data collection and secondary data collection. The vegetation analysis was done through quadrat sampling method with sample size 0.1%. Two management committees, one of monks and the local people from the nearby villages constitute the other, were found to manage the Monastery. The study revealed that the Monasteries have their own forests from which there is some extraction for religious rituals, but not for other uses. The monastery forests were recorded to have rich biodiversity in comparison to village forests in all sites. Due to the culture, customs and traditions, all the communities respect the Monastery Forests and do not disturb the area. This shows that if the people take and harvest the forest product sustainably and protect it like Monastery forests, then the condition of the village forests may improve. The local people possess great knowledge on biodiversity resources and the local environment. They have their own traditional ways of managing resources. There is need to gather such knowledge and incorporate the same knowledge in forest management, education system, technical training and development programmes.

Keywords:

Monastery forest, Village forest, biodiversity, institutional aspect.

INTRODUCTION

The Himalayan state of Sikkim in India is endowed with biological resources due to altitudinal variation resulting a variety of ecosystems. The strongest element in supporting and promoting community based natural resource conservation efforts in the state lie in the deep respect and spiritual values of local Sikkimese. The entire landscape including mountain peaks, forests, lakes, rivers are sacred and are worshipped and valued. Monasteries play a very important role in the social and cultural lives of many Sikkimese and are highly respected. As a

results, these relatively small areas, Gumpa or monastery forests are relatively in good ecological condition. Almost all the Monasteries are responsible for some amount of unintentional biodiversity conservation, arising from sacred forests, sacred lakes, sacred stones and sacred spaces around these institutions. Even lakes and mountains rocks and caves, springs and rivers here are considered holy as a result of which there is natural inhibition about polluting them (Lachungpa, 2002). Many of the Monasteries have their own forests from which there is some extraction for religious rituals, but not for other

uses. Most of these Monasteries are set in biodiversity rich warm and cool temperate forests types and represent a small but interesting aspect of traditional yet non government management of forest resources.

There are also private and monastery forests, other than the legally classified categories of forest described by Forest Department. Around many of the monasteries in Sikkim such as Pemayangste, Dubdi, Lanchung, Ralang, Sangacholing, Phodong, Khecheoparli and so on are small areas of forest (often several hectares.) that are relatively distributed by human impact (Jain, 2002).

The local people possess vast knowledge on biodiversity resources and the local environment. They have their own traditional ways of managing resources. There is need to gather such knowledge and incorporate the same knowledge in forest

management, education system, technical training and development programmes. In view of this, present study was conducted to know the ecological perspectives and organizational constraints of the Monastery forests in Sikkim Himalayas.

MATERIAL AND METHODS

Study area

Based on the discussion with the experts of various areas, two districts of Sikkim namely; South and West were selected for the present study. There are 23 monasteries in South district and 15 Monastery in West district, out of which six Monasteries (Chhuba, Ralang and Melli monastery in South Sikkim and Dubdi, Tashiding and Pemayangste in West Sikkim) were selected for the study namely; Table 1.

Table 1: Area wise location of Monastery is south and west district of Sikkim

District	Name of Place	Altitude
South district	Chhuba	1600 m
	Ralang (old)	2100 m
	Melli	900 m
	Dubdi	2066 m
West district	Tashiding	1450 m
	Pegmangste	2500 m

The data was collected in two ways i.e., primary data collection and secondary data collection. Primary data collection was done through Participatory Rural Appraisal (PRA) semi-structured questionnaires, field observation,

RESULTS AND DISCUSSION

Institutional aspect of monastery forests

Table 2 shows that the monasteries namely; Dubdi, Tashiding and Pemayanste were established in 16th century, followed by Ralang in 17th century whereas Chhuba and Melli were established in 19th century. The Pemayangste monastery is situated at highest altitude i.e. 2500 m above sea level among six and Melli is at lowest

discussion and informal interviews with local people, stakeholder analysis. The phyto-sociological analysis of vegetation was done using frequency, density, basal area and Importance Value Index (IVI).

altitude i.e. 900 m. The area of the Pemagyanste Monastery is maximum (>80 acres) and the minimum is of Chhuba Monastery (7 acres).

In each Monastery there are two management committees, one is of Monastery monk's and other is of local people's of nearby village. The former is responsible for internal matter of Monastery later for the fund collection and participation, management of festivals.

Table 2: Status and comparative analysis of Institutional aspect of Monastery Forests

Parameters	Monastery					
	Dubdi	Tashiding	Pemagyanste	Chhuba	Melli	Ralang
Establishment	16 th century	16 th century	16 th century	19 th century	19 th century	17 th century
Area	30 acres	70 acres	> 80 acres	7 acre	17 acre	50 acre
Altitude	2066 m	1450 m	2500 m	1600 m	900 m	2150 m
Ownership	Monastery	Monastery	Monastery	Monastery	Monastery	Monastery
Location	West district	West district	West district	South District	South District	South District
Committees	2	2	2	1	2	2

Administrative aspects of Monastery

A perusal of information on community homogeneity shows that the all the Monasteries perceived high homogeneity and unity in Monastery committee. The Monasteries are managed from conservation point of view and there is ban on tree cutting , grazing, fuel wood collection. This is ensured by daily patrolling of Monastery area by Monks. Thus,

The information about management techniques reveals that there are three or more techniques of management, which all the Monasteries are using to manage their forest. All the forest management techniques were found

more or less same in all six monasteries. Similar management techniques have also been reported by Jain (2001).

Networking in Monastery Forest

Table 3 shows that the information related to relationship of the Monastery with other organization reveals that all the monasteries are partly related with Govt. organization but closely related with local communities where as relations within monasteries are also strong and helping each other. While relation with Forest department (FD) is partly related only for the marking orders otherwise there are some conflicts among FD and authority on the areas of Monastery.

Table 3: Status and comparative analysis of Networking in Monastery Forest

Parameters	Monastery					
	Dubdi	Tashiding	Pemagya nste	Chhuba	Melli	Ralang
Relation with Government organization	3*	3*	3*	2*	3*	3*
Relation with local community	3*	3*	3*	2*	3*	3*
Relation among them self	3*	3*	3*	2*	3*	3*
Relation with FD	3*	3*	3*	2*	2*	3*

(Ranking: 1*→ No relation, 2*→ Partly related, 3*→ Closely related with mutual understanding)

As evident from Table 5 there is no variation found in environmental concern except in Melli monastery. It is found that all are good except Melli. The vegetation status of Melli was found to be very degraded compared to other monasteries (Table 5). Fuelwood collection in Monastery by monks' for daily needs was found in all Monastery (Jain, 2002).

Vegetation analysis

The vegetation analysis study was carried out to analyze the activities of community based Monastery forest in Sikkim Himalayas. In order to

carry out the study, two types of forest management groups (Monastery forest and Village forest) were identified and accessed the vegetation analysis study in these forests under different six sites (Chhuba, Ralang and Melli in South district and Dubdi, Tashiding and Pemayangste Monastery in west district of Sikkim). To analyze the biodiversity, number of individuals per ha., Number of Species per sties, total basal area of all species per hector and Importance Value Index (IVI) of the species were calculated shown in Table 5.

Table 5: Status and comparative analysis of Ecological aspect of Monastery Forest

Name of Monastery	Number of species		No of individuals		Basal Area m ² /ha		Important value index range	
			Pl./ha		MF	VF	MF	VF
	MF	VF	MF	VF				
Melli	7	4	900	1850	14.54	19.98	14.28-71.33	19.82-181.12
Ralang	5	5	1350	1150	57.53	10.82	26.78-136.62	22.16-81.97
Chhuba	9	6	1900	2250	205.68	14.00	9.81-119.81	11.95-114.28
Dubdi	6	4	2300	750	261.20	21.19	24.74-92.05	41.46-166.16
Tashiding	7	4	2600	750	94.65	12.93	11.48-82.21	52.90-97.30
Pemayangste	8	4	3150	600	182.40	11.18	5.62-131.01	42.90-139.89

MF- Monastery forest, VF- Village forest

Among the all study sites Chhuba Monastery is very good in terms of Biodiversity i.e. it has maximum number (9) of species followed by Pemayangste Monastery forest (9). The Monastery was very good in biodiversity in comparison to village forest in all the sites. Monastery forests which are the sacred places and they are relatively undisturbed, thus they have good biodiversity. Among the studied forest of six sites least number of species in Monastery forest were observed in Ralang Monastery forest.

More of less all the village forest were degraded and disturbed and had fewer numbers of species. In village forest the maximum number of species i.e. 6 recorded in Chhuba village forest and it followed by 5 in Ralang village forest. The Least number of species where observed in Melli, Dubdi, Tashiding and Pemayangste. The both types of

Forest in Chhuba sites were very good in biodiversity, because they were representing diverse species composition.

The stand density per ha. was also found higher in Monastery forest and it was observed in Pemayangste Monastery. It ranged from 3150 number of individuals per ha/ found in Pemayangste Monastery forest to 600 number of individuals in village forest of the same area. In Monastery forest it is highest in Pemayangste Monastery sites where as least in Melli Monastery forest. The result found that the village forest were degraded in all the sites and had not so good in enough number. The maximum value of stand density per ha. 2250 was found in Chhuba village forest and the lowest value was observed in Pemayangste Village forests.

The wide range of basal area contribution in study area can be explained in terms of site heterogeneity. There is large range of basal area of species obtained from 10.82 m²/ha to 261.20 m²/ha. The value of basal was also found higher in Monastery forests and lowest in village forests. The maximum value of basal area i.e. 261.20 m²/ha was observed in Dubdi sites and the lowest 10.82 m²/ha in Ralang site. The lowest value of basal area found in Melli Monastery forest i.e. only 14.54 m²/ha. Village forests are getting severely affected due to human pressure and thus there is good number and total basal area of species. It ranged only from 10.82 m²/ha that was in Ralang forest village forest to 21.19 m²/ha in Dubdi Village forest. In terms of basal area the highest value of species per ha. In both the sites was dominated by Dubdi site. It may be due to the presence of well-matured trees and good and well protected forest.

Importance value index which represents the overall vegetation characteristics of area. The results revealed that there were wide ranges of IVI of a species found in village forest and narrow in Monastery forest. The wide range of IVI determines the dominance of single species, which is found in Melli village forest, where their *Eurya accuminata* is dominant. There is least difference in IVI species found in Monastery forest of Melli which gives all species were equally growing. The result showed that *Catanopsis indica* species had good dominance /IVI in Monastery forest of Chhuba and Ralang and Village forest Dubdi and Tashiding Monastery. The second dominant species having maximum IVI value in different places was that of *Eurya accuminata* which was predominantly found in village forest of Ralang and Melli and Monastery forest of Melli.

The result says Melli is an *Eurya accuminata* dominant forest habitat where both Monastery forest and village forest site were dominated. In village forest there were diverse types of dominant species, which are *S. theifolia* in Chhuba, *Eurya accuminata* in Ralang and Melli, *Castanopsis indica* in Dubdi and Tashiding and *Engelhardtia spicata* in Pemayangste. Similarly it is dominant in Monastery forest of the species *Castanopsis*

indica in Chhuba and Ralang, *Eurya accuminata* in Melli, *Juniferous* in Dubdi, *Catanopsis hystrix* in Pemayangste and *Castanopsis tribulides* in Tashiding.

The overall result shows that the study area is very rich in species number, higher density of species per hectares and basal area of species per hectares was found in village forests. Sundriyal and Sharma (1996) observed that there are trends of indiscriminate cutting and mismanagement during recent years, which has resulted in more damage to the vegetation. Because of the well-managed Monastery forests, they were good in number and size of tree species. In view of biodiversity, the Chhuba Monastery forests were good in among all study sites. Out of all, Dubdi Monastery forests was very good in number of individuals/ha and basal area. Due to presence of higher number of species per hectare and species having maximum basal area, it has relatively fewer numbers of species. The same result followed in Pemayangste Monastery forests, which had the highest number of individuals per hectare and species, had moderate basal area. Though all the village forests were not in good condition, Chhuba village forests were very good in terms of total number of individuals/ha, basal area/ha and number of species followed by Ralang village forest. Out of all six sites Pemayangste village forest had very worse results in view of species number, No. of individuals per ha and total basal area per ha. The presence of dominant forest tree species *Engelhardtia spicata* indicated the presence of the disturbance gradient in this site. Similar predictions were given by (Jain, 2001 and Lachugpa, 2002).

CONCLUSION

The mountain people of Sikkim depend mostly on the side by natural resources especially forests to fulfill their daily needs. The population is increasing at alarming rate and hence the pressure on the forest is increase day by day. In spite of this problem the Monastery forest are yet virgin as compared to Village forest. Due to the Culture, customs and traditions, all the community respect the Monastery Forests and do not disturb the area.

This shows that if the people take and harvest the forest product sustainably and protect it like Monastery forests, then the condition of the village forests may be improved.

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REFERENCES

Jain N 2002 Sikkim biodiversity and Ecotourism project (1995-1998). In: Souht Asia

perspectives on Ecotourism and conservation. Krishna AP, Rai PD and Suuba J (eds.). Ecotourism and Conservation Society of Sikkim,

Gangtok, India: pp. 89-96.

Jain N 2001 (unpublished) Community conservation in the Sikkim Himalaya. The Mountain Institute, Kathmandu.

Lachungpa U 2002 Biodiversity strategy and action plan (BSAP) process in North Sikkim. In: Souht Asia perspectives on Ecotourism and conservation. Krishna AP, Rai PD and Suuba J (eds.), Ecotourism and Conservation Society of Sikkim, Gangtok, India: pp. 141- 152.

Sundriyal RC and Sharma E 1996 Anthropogenic pressure on tree structure and biomass in the temperate forest on Mamlay watershed in Sikkim. *Forest Ecology and Management* **81(1-3)**: 113–134.