

Quantification of Forest Resource Withdrawal from Temperate and Tropical Regions of Western Himalayas: A Comparative Analysis

Abstract

Forests form an important base for both subsistence as well as commercial purpose. The desecration of this resource has resulted in the change, form and composition. The people residing within the vicinity of the forest ecosystem develop various adjustment patterns in response to their immediate environment. This situation then follows with a particular interactive system. Interestingly there has been found an intimate relation of people, animals and environment. The basic principles of their life and total picture of human adjustment depicts overall picture of interaction. The present paper attempts to focus on their interactive pattern, which gives an idea on the response of human and animal interaction to diversified environmental situation in struggle to surroundings. People always prepare themselves to cope up with the ecological setting of the forest in their daily behavioral pattern of effort to adjust themselves to forest withdrawals. The attempt of understanding this interaction in the Western Himalayan Region at different altitudinal levels has been studied under various parameters like fuel wood, fodder and grass cutting. Despite different climatic conditions the pattern remains the same but the intensity varies. For complete understanding of the interactive pattern the three parameters were selected, i) Fuel wood ii) Lopping of trees and iii) grass cutting. These limited but effective parameters were assessed at different climatic parameters and the quantification of the biomass was then generated and finally a comparative analysis of the of the forest biomass withdrawals was done in Temperate as well as Tropical regions. The study is completely based on the Primary data generated from the two villages, village Sawjian and village, Khanga which were considered to be the best representative of the area.

Keywords: Subsistence, Commercial, Ecosystem, Biotic interaction, ecological, Temperate, Tropical, biomass

Anuradha Sharma

Associate Professor
Department of Geography
University of Jammu,
Jammu

Introduction

Forest form an important resource base for both subsistence and commercial purpose. They are regarded as the components of carbon and water cycle. They are also regarded as the reservoir of resources and if handled carefully the economic life of the people who are living with forest ecosystem can be enriched. The traditions have taken care of resources without their degradation but unfortunately the colonial rule and its imposition came with a change in attitude. The people who reside within forest ecosystem develop specific set of responses to the immediate environmental situation giving rise to a particular pattern of life. Different environmental surroundings develop varying response to their native ecological situations, People who live in plain areas with rich soil, tend to grow the crops most suitable to the area and adopt themselves to the existing conditions. Those living in desert areas of the world respond to hot climatic conditions with the kind of adaptability most suitable to the surroundings. Likewise the people and animals that live in mountain ecosystem have developed a unique way of struggle with their immediate environment. We need to understand their response to diversified environmental situation. People always prepare themselves to cope with ecological slitting of the forests in their day to day requirements. It is an urgent necessity to understand man animal forest ecological pattern and people's effort to adjust themselves with the ecological setting of the

Asian Resonance

forest surroundings. In the process, certain urgent issues get raised regarding their existence and requirements. There is an urgent necessity to make all possible efforts to understand the problems of these forest dwellers in the face of changing ecology and how it affects their economic structure. There seems a legitimate demand among the social scientists to see the situation in a broader and deeper context and not as a select of the past.

Himalayas are considered as an ecologically fragile system which is deeply rooted in its geological and morphological settings. In the process of vanishing forest cover many species have already been eliminated, replaced or are in the process to reach this stage soon. Hence the serious ecological disorder is experienced in the Himalayan region. The western Himalayan region faces all these problems and the result is poverty as well as under development. The economic hardships and associated ills have gradually crept into the lives of the people. It is in this context that the present study on the withdrawal of forest resources has been conceived based on certain limited but effective parameters at various altitudinal levels. An attempt has also been made to make a comparative analysis of the withdrawals of biomass from the two different climatic situations based on different altitudinal levels.

Methodology

The study has been conducted under three main parameters. (i) Fuel wood (ii) lopping of trees and Grass cutting. Fuel wood withdrawal has been the basic energy requirement of the people of the region under consideration. It is the only source of energy for the Himalayan natives. The data regarding the consumption of fuel wood was generated by conducting intensive field work for actual fuel wood consumed in different months of the year before being released for the use in selected representative households. On the basis of average consumption of fuel wood per household, the total withdrawal of fuelwood from the forest was calculated.

Lopping is another kind of forest resources withdrawal for fodder and cutting the grasses from the surroundings as well as from the enclosed areas especially kept for the purpose. This lopped biomass is stall fed to animals. The head loads of the selected households were weighed for seven days and then averages were worked out and total biomass in terms of lopping was made possible.

Grasses withdrawn from August to October are meant for stall-feeding to the cattle during the intense winters. Although the requirement of stall-feeding varies depending upon the number and type of animals kept by a household but everyone wants to store as much as possible as it also finds readily available market. Hence the storage of grass is independent of requirement and assumes almost a uniform pattern. The study area enjoys two dry and two wet spells in a year. First dry spell occurs from March to June, which is followed by a wet spell from July to September in which rainfall is caused by the monsoon winds. This rainy season is then again followed by a dry spell from mid September to

December after which precipitation is caused by the Western disturbances. Due to the low temperature conditions from November to March which adversely influence the growth of grasses. It is due to this reason that we find variation in the availability of grasses and consequently the withdrawal of biomass from the forests due to grazing. Hence it can be concluded that animals find almost enough grasses to graze to satisfy their entire need from Mid way to mid September while in the rest of the grazing period it becomes difficult for them to meet their requirements and are compelled to remain underfed are not allowed into the forest by the villagers. It is again followed by a period of intense grazing from mid September to mid November after which weather conditions again restrict the animal's movement outside the house. On an average animals are allowed to graze for about eight months in a year but after consulting locals and personal observations, 182 days of grazing have been considered in temperate region and 300 days in tropical region. Hence the schedule both the regions differ. Hence the dependency on the grass cutting from enclosed forest land becomes a necessity and the people bring huge loads of grasses to feed their animals.

Study Area

Village Sawjian with 196 households is located in Tehsil Haveli of Poonch district, and is 12 km away from the main road connecting Poonch with Mandi the approach to village is only by Kachha road and the villagers are totally dependent on a local market centre for meeting their daily requirements. There is negligible interaction between tehsil and district headquarter and the people the village under discussion is surrounded by beautiful hills and Dhoks (local name for meadow), covered with conifer and broad leaved trees. On the east lies 'Sappan wali Dhok' and 'Altar Pahar'. In the North east lies 'Trunga wall Dhok' and 'Doda Dhok' on the South - Fact 11 Dubali Loran gait and 'Grang Gali' and the hill situated to the North is named as 'Molsar'. This village is traversed by number of Nallahs, the main being Sundri Nallah, Molsar Nallah and Sajjan wala Nallah. Sundry Nallah flows along Molsar Nallah hill. The source of all the Nallahs is located at Trapha which later bifurcates into Gagrian Nallah which flows from Nagiana till Mandi and finally joins Surankot river at Kalai (Near Kali Bridge) and ultimately joins Jhelum river. All these Nallahs are perennial. There are 17 springs in the village and no dead spring has been recorded.

The village Khanga with 193 households is situated in Tehsil Ramban. The village is located 8 kms away from the National highway and the road leading to the village is a Kachha road. People in the village interact less with the district headquarter. A local market centre (Dhinga) is there in the village which serves their daily requirements. This village is surrounded by 'Flara Gua' in south, 'Dami Kala' in North East and Dali' in the East. There is no nallah flowing in the village and people are totally dependent on springs for their water requirements. There are

Asian Resonance

seven springs within the village and no dead spring has been recorded.

Analysis And Discussion

Fuel Wood

Energy plays a vital role in human development welfare as all modern economic the recent civilization are dependents on availability and level of consumption of energy. A cursory look at the Table No1 .reveals that there is no variation in the number of days for collection of the wood. They have been considered for the whole year since the fuel wood requirement remains for all the year round in both the villages. The fuel wood may not be required during the summer months for heating the house but for the cooking it is a daily need. The Himalayas remain covered with thick forest and the people have developed culture where wood is considered the only source of fuel. It is pertinent to state here that the wood is used for heating the houses in village. Swajian which lies above 2200 mts. amsl and becomes quite cold during the winter months. The fuel wood is then required to raise the temperature of the house. The fuel wood requirement is not as high as in village Swajian due to the warmer climatic conditions being in tropical region. In Swajian village the entire fuel wood is obtained from the forest. The collection is mainly done by women and children but adult male also venture in the time of the distress. The summer season is the optimum time for the collection of the dry wood lying on the ground of forests.

Table- 1.

Period of collection

Forest Biomass	Villages		Number of Days	
	Sawjian	Khanga	Sawjian	Khanga
Fuel Wood	Jan-Dec	Jan-Dec	356	356
Lopping	Feb to June and Sep to Nov	Feb to June and Sep to Mid Dec.	244	260
Grasses	Aug. Sep and October	March, April and Mid July to Mid. Oct.	92	152

Source: Survey Conducted by the author

A cursory look at the table reveals that there is no variation in the number of days for collection of fuel wood. They have been considered for the whole year since the fuel wood requirement remains constant the all year round in both the villages. The fuel wood may not be required during the summer months for heating the house but for cooking, requirement remains constant same for the whole year. The double amount of fuel wood is required during the winter months for heating purpose hence the average amount of fuel wood collected from the forest is distributed for the whole year i.e. for 365 days.

Use of fuel wood is influenced by the climatic conditions prevailing in different months of the year. During the summer months consumption level falls substantially while in winters it reaches its, peak. The analysis of fuel wood withdrawal reveals that there is

an appreciable variation in the consumption of fuel wood in the different months of the year. The table number-2 clearly indicates that during the summer months (for 153 days) in village Swajian from May to September the average consumption has been barely 15 kgs which than increase to 23 Kgs in the month April, October and November and finally during the winter months of December to March (for 121 days) the consumption of fuel wood shoots upto 37 Kg/day/household. The average figure calculated over 365 day's amount to 24.28 Kgs. In the village Khanga during the winter months i.e. from December to February barely 12 kgs is the fuelwood withdrawal from the forest during the winter season and during the summers.

Table 2.

Biomass withdraw by Fuel Wood collection

Village	No. of House holds	Period of collection	Average /Day /House hold	Total in a days by the Village	May to September/Day/Household	Total in 153 day	December to March	Total in 121 days	Total in a year by the village in Metric Tons
Sawjian	396	April, Oct. and November	23	828828	15	908820	37	By the village 1772892	3510.53
Khanga	193	March to November	10	Total in 275 days			12	Total in 90 days by villages	739.190
				530750				208440	

Source; Data collected by the author.

There is not much difference since it amounts to only 10 Kgs/day per household. The reason behind the marginal differences in the withdrawal is the lower altitude at which village Khanga is located coupled with less availability of wood. The village on the whole extracts about 739.190 mls of fuel wood in a year and the average fuel wood consumption per day per household comes to 10.49 Kgs.

Lopping

The lopping days for village Sawjian are 244 and Khanga they have been considered as 260 since in winters the collection days in term of lopping get extended till mid of December. Lopping is another very important activity carried out in both the villages lying at different altitudes particularly broad leaved ones for fodder, is a common practice. In both the villages people make certain consideration while lopping, the leaf content of the branch lopped, the length of the branch and the age of the branch. While being in the field it was gathered that with the increase in the age of the branch, its leaf content and as such its overall weight increases appreciably and so does its length. Thus an aged branch would yield higher amount of leaf content in terms of weight and is generally preferred. But it has also been observed that in certain cases the love for certain pet animals may influence the mind of the lopper to lop a young branch for tender leaves to the feed his pet. But the overall

Asian Resonance

share of this type of lopping is insignificant to demand any special attention.

The average length of branch lopped varies between 70cm to 1 mt. The oak of different shades are used for lopping purpose. It is also interesting to note that in the both the villages every household indulges in the lopping activity for more than one reason. In the first place the man wants to provide best diet to his livestock resources and secondly the activity implements its total requirement of fodder. It has further been established that even if a small farmer has very few animal heads even he would not bring less amount of lopped tree leaves as he depends heavily on this fodder. It was also observed that the head load of individuals differ appreciably. It was therefore; felt to weigh the head loads of lopped trees brought by (I) women (young, middle aged and old) and (ii) Men (young, middle aged and old). After getting the data from at least seven persons over a period of seven days for each category the average weight of lopped biomass was reached at for that particular village. The Lopping is again not practical throughout the year. The conduct of intensive field work reveals the following fodder withdrawal pattern.

Table 3.
Biomass withdrawn by Lopping (IN KG)

Village	No. of House school	Period of collection	Average/Day /House hold	Lopping in 244 days / household	Total lopping in the village in metric tons
Sawjian	396	Feb to June and September to November	27	6588	2608.88
Khanga	193	Feb to June and September to mid December	23	5980	1154.14

Source :Data Collected by the author

In case of village Sawjian this activity is carried on only for about 8 months (244 days); a year. The average biomass withdrawal in terms of lopping for each household was estimated to be 27 kgs which accounts to 6588 Kgs in 244 days and the total biomass withdrawal turnout of the whole village was estimated to 2608.8 MTS. Khanga being situated at a lower altitude withdraws 23 kg per day per household and for 260 days the withdrawal per household reaches to 5980 Kgs and the total village's lopped biomass withdrawal in one year is estimated at 115414 M.Ts. Initially it may be assessed that the total biomass withdrawn in the shape of lopped branches of the forest trees for Sawjian and Khanga seems quite a staggering figure of 2608 M.Ts and M.Ts in a season but when it comes to be fed to individual cattle head on an average then it slides to only 27 kg/ head/ day and 23 kg/ head/ day of livestock for the respective villages. But it has been observed that major share of this lopped green fodder goes to draught animals although the lopped

branches of the forest trees for Sawjian and Khanga seems adopting a differential feeding schedule that provides adequate green fodder to the cattle head he thinks would provide him returns.

Grasses

The livestock rearing is an important economic activity in these two villages. This is judged by the total number of live stock available in the village that comes to 2943 and 2066 for Sawjian and Khanga respectively. The calculated average comes to 30 cattle head / household and 21 cattle head / household in village Sawjian and Khanga respectively. This is not a mean number judging by the lack of land available for the agricultural purposes due to hilly terrain of the region. The climatic conditions allow the cattle to graze for only 182 days and 300 days in Sawjian and Khanga in a year at the best and for the rest of the period these live stocks are stall fed. Although the agricultural crop residue is used as a fodder for stall feeding but it remains less than the required. The people here, therefore, have to depend upon forests for grasses and tree leaves to meet this demand. Besides, the farmer would like his cattle to get a variety of fodder to maintain a balance in the diet of his livestock. As such the man in the hilly region depends heavily on the forest for obtaining grass as fodder for his live stock resource. The grasses for the forest are not available throughout the year. Being biological in nature, the grasses have a specific period of growth and maturity. The man in this region is quite familiar with the life cycle and types of the grasses found here and hence it is pertinent to mention here that besides cutting the grasses from the forests. The man also obtains grasses from his own land kept especially for the purpose and is capable if planning for their harvest. As such the grass cutting in village Sawjian begins in the month of August and ends in October; it is the natural growth of grasses. Since this land varies from one individual to another thereby giving a great amount of variability.

Table no-4

Total Number of livestock

S.No.	Type of Animals	Total Population (Sawjian)		Total Population (Khanga)	
		Adult	Minor	Adult	Minor
1	Cow	462	234	278	146
2	Buffalo	140	98	227	153
3	Oxen	200	70	331	140
4	Sheep	493	536	176	80
5	Goat	321	351	326	150
6	Pack Animal	29	9	31	28
Total		1645	1298	1369	697

Source Data Collected by the author

Grass cutting for stall feeding to the live stock in the village Khanga extends over a long period of time as compared to village Sawjian because tropical to subtropical climatic conditions create most suitable environment for higher rate of biomass growth. Further two wet and two dry seasons too influence the activity of grass withdrawal from the

Asian Resonance

forests. As a result of it we find the grass is withdrawn during March, April followed by a slack season in grass cutting during May and June (dry spell) when high temperatures in the absence of soil moisture content reduce the biological productivity to the state of naught. With the onset of Monsoon in the last week of June and first week of July the conditions are reversed and biological activities get a sudden impetus resulting thereby in an abrupt and prompt growth of grass cover all over. As a result of it grass cutting begins from somewhere in Mid July and continues upto the middle of October. Taking all these factors into consideration it was established that the grasses withdrawn in September to ending of season are kept for stall feeding during the winter season.

Table 5.
With Drawal of Grasses (In KG)

Village	No. of House Holds	Period of collection	Average/Day/Hous ehold	Lopping in 244 days / household	Total looping in the village in metric tons
Sawjian	396	August September and October	30	2760	1092.66
Khanga	193	March August and mid July to Mid October	21	Grasses with drawn from 152 days	616.056

Source Data Collected by the author

Weaving together all these facts, an attempt is made to analyze the total biomass withdrawn from the forest in the two villages under study under different climatic and altitudinal variations. A cursory look at the table reveals that Sawjian village with 396 households and Khanga village with 193 households withdraws 30 kg and 21 kgs of grass per day per household respectively. During 92 days period of grass withdrawal. 2760 kgs in sawjian and during 152 days period of grass withdrawal. 3192 kgs. in Khanga is collected per household. The total grass bioma.ss quantity withdrawn from village sawjian and Khanga per year is estimated at 1092.96 M.Ts and 616.056 M.Ts. respectively.

Conclusion

The principal objective of the study was to understand the material /resource movement in the villages under discussion in fragile Himalayan environment differentiated by various physical characteristics. The study also undertook to see the man forest interactive scenario In the face of man ever growing demands from nature. The results of the analysis are vivid and clear variations in the consumptional pattern of fuelwood, fodder and grass cutting have been observed. The average consumption of fuel wood/day/household during 91 days of April, October and November stands at 23 kg in Sawjian and from March to November and December to February in winter months stands at 10 kg/day/household in village khanga. The average

annual grass withdrawal/household is 30 kgs in village Sawjian and 21 kg in village Khanga. The analysis of lopped biomass reveals that 23 kgs/day in the months of April, October and November and 37 kg/day/HH from December to March is collected from village Sawjian whereas from March to Nov ember 10 kg/day/HH and 12 kg from December to February in village Khanga is collected in terms of fuel wood. The forests are the store house of the resources on which the man is dependent but this store house cannot meet the increasing demand of ever growing human and live stock population hence constant forest growth is required. We also need to maintain at least the existing resources to meet the demand of the Himalayas dwellers. The increasing rates of development processes are demanding the shrinkage forest resources but its implications can be well understood keeping in mind the existing man/animal forest interaction. Thus study the demands an appraisal of existing/resources in terms of meeting the basic requirements of the people living within the vicinity of the western Himalayan region.

References

1. 'Report of Field Wood studs' committee', Govt. of India Planning Commission, New Delhi, 1982.
2. Banerjee, (1989) A Text Book of G.C. Animal Husbandary 3 Edition. Oxford and IBH Publishing Co.
3. Chowdhary, S All about Monures Pub. Benoy K. Dhar, Karingang Assam.
4. Indian Council of Agricultural Research New Delhi.
5. Raghavan, D. (I 964) Handbook of Manures and Fertilizers.
6. Vindo. O.P., and Tyagi, P.D. Fuel Wood from Wasteland" Yatan Publication. New Delhi 1986.