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RESEARCH ARTICLE

FODDER AND FUEL UTILIZATION PATTERN IN VILLAGE FULWARI OF DISTRICT RAJOURI, J&K (INDIA)

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ABSTRACT

The present study was conducted to understand the status of fodder and fuel utilization pattern in village Fulwari of tehsil Sunderbani, district Rajouri in Jammu and Kashmir State, India. The common types of fodder used in the study area were crop residue, green fodder, top feed and tree leaves. The crop residue consumption was found to be highest i.e. 7.367 kg/day/family, while green fodder was least consumed (1.33 kg/day/family). The major fuel types consumed in the study area were fuel wood, liquefied petroleum gas, dung cake and kerosene oil. Fuel wood constituted the major share of consumption which was 86.53% while kerosene oil consumption was found least. The total fuel consumption in the study area was found to be 36.6×10^6 kcal/month.

Key words:

Emergy, Fodder, Fuel, Resource.

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INTRODUCTION

Energy is an integral part of a society and plays a vital role in its socio-economic development by raising standard of living and quality of life. The state of economic development of any region can be accessed from the pattern and consumption quality of its energy. But the current inefficient energy use in various sectors has led to the serious ecological and environmental problems (Ramachandra *et al.*, 2000). Therefore, it is necessary to ensure adequate availability of energy sources, especially in rural areas to support the process of rural development as it is a major instrument for improving household living standards, and increasing agricultural and livestock production (Kashap *et al.*, 2015).

In India, more than 70% population lives in rural areas and they satisfy 80% of their energy needs from the fuel wood collected from the nearby sites and forests and every year about 50 million tons of wood is removed (Dhanai *et al.*, 2014). The villagers still rely heavily on traditional biomass based fuels like fuel wood, crop residue and animal dung for meeting their energy needs. These fuels are used even in areas with access to modern fuels (Joon *et al.*, 2009). Demand for fuel wood from forests and commons causes resource degradation to the extent that collection exceeds sustainable yield.

India is predominantly an agricultural country and has the largest livestock population in the world (Palni, 1996). India's total fodder consuming livestock population as per 2007

livestock census is estimated to be 518.6 million. Of these, 199.6 million of livestock depend partially or fully on forests for fodder. About 30-50 % of total animal feed is derived from forests and grasslands (Bajracharya, 1999). The large livestock population also results in huge collection of tree fodder, which affects the forests quality adversely.

In Jammu and Kashmir, due to its temperate, dry temperature and cold arid conditions, huge quantity of energy is required as fuel for cooking of food as well as keeping the houses warm during severe winter. To meet the demands of fuel wood, the households are usually dependent on the forests or other community lands. Due to overexploitation of fuel wood and fodder resources, there is a detrimental impact on the forests which results in deforestation, disturbed ecosystem, erratic rainfall, recurrent soil erosion, loss of habitat of wild animals, loss of biodiversity etc. In this context, the present study was conducted to know the fuel and fodder utilization pattern in village Fulwari of tehsil Sunderbani, District Rajouri of Jammu and Kashmir state, India.

METHODOLOGY

The study area was village Fulwari of tehsil Sunderbani, district Rajouri in Jammu and Kashmir State. The study area lies between 33.04°N and 74.49°E. Village Fulwari was located 70 km away from Rajouri town and 76 km away from the winter capital Jammu. For the collection of data, a detailed

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questionnaire was prepared involving the various aspects such as income, literacy status, types of occupation, land use pattern, details of bovine population, sources and other details of fuel and fodder collection, utilization, quantity and types of fuel consumed. Other miscellaneous information were also collected. The survey was conducted in thirty houses on random basis from centre of the village to the periphery to obtain the real pattern of information.

The survey of demographic status of the study area involved the use of adult units i.e., one man =1 adult unit, one woman=0.8 adult unit and one child=0.5 adult unit, to find out the average size of family (Sharma, 1993). For calculating the landholding, the units used were, one kanal =1/8 Acre, and one hectare=2.471 Acres. All kinds of livestock in the sample household were converted into cow units using equality coefficients i.e., 1 cow unit for one cow, 1.5 cow units for one buffalo, 0.15 cow units for one goat/sheep and 1.5 cow units for one bullock (Jackson, 1981). Units used for quantity of animal droppings were 15 kg/day, 10 kg/day and 02 kg/day for bullock, buffalo, he-buffalo, cow and sheep/goat, respectively (Rao, 2000). Energy units used for different fuel types were, one kilogram of firewood=4000 k.cal, one kilogram dung cake=2400 k.cal, one kilogram crop residue=3200 k.cal, one kilogram of LPG=10800 k.cal and one liter kerosene=7900 k.cal (Veena, 1988).

RESULTS AND DISCUSSION

An exploratory study was carried out at household level to find out the annual income, land holdings, cow units per household, dung produced per household, literacy status, fuel and fodder consumption pattern with its environmental impacts interrelating socio-economic and demographic factors in the study area.

Socio-economic and literacy status

Population of the study area was divided into four categories viz., very low, low, medium and high on the basis of their monthly income. The representation of high income class was found to be 66.66%, followed by medium, low and very low income class groups (Fig. 1).

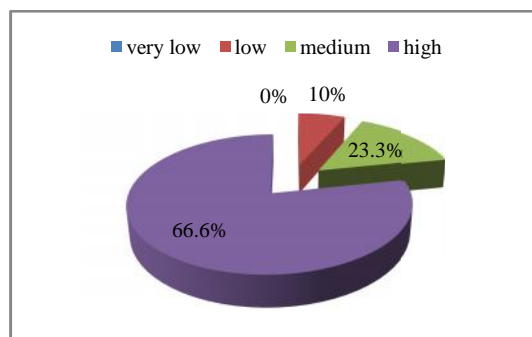


Fig. 1 Representation of various income classes in the study area

The highest share of high income class group was due to the reason that they had high land holding and comparatively high rate of employment in government jobs. However, Akhter and Malaviya (2014) in their study in village Chak Chua of district Jammu found a large gap between medium income class and

other income classes due to large land holdings of medium income class. The average annual income per family in the study area was found to be Rs. 2,04,000. Literacy status of the males and females in the study area was 90.07% and 75.69%, respectively. It was high as compared to the overall literacy status of the Jammu and Kashmir which is 78.26% for males and 58.31% for females. Comparatively low literacy among females was probably due to the fact that people were not aware about the importance of women literacy. Kumar (2002) reported a high literacy rate of 64% for males and 55% for females in Dandesar village of district Rajouri.

Fodder consumption pattern

The common types of fodder used in the study area were crop residue, green fodder, top feed and tree leaves. The crop residue utilization was found to be highest (7.36 kg/day/family), followed by tree leaves (5.06 kg/day/family), top feed (3.97 kg/day/family) and green fodder (1.33 kg/day/family) [Table 1].

Table 1 Fodder consumption pattern in the study area

S. NO.	Fodder type	Quantity required (day/family/kg)	Percent share in total requirement	Source of collection	Average distance covered for collection (km)
1.	Green fodder	1.33	7.51	Agricultural fields	0.5
2.	Top feed	3.97	22.36	Market/flour mills	1
3.	Crop residue	7.367	41.54	Agricultural fields	0.25
4.	Tree leaves	5.06	28.57	Forests & common lands	1-2

The highest consumption of crop residue was also reported by Kashap et al. (2015) in village Khatruee of district Jammu (J&K). In contrast, highest consumption of green fodder was reported by Qureshi et al. (2015). It has been observed that consumption of green fodder varied in different season. During the rainy season, green fodder dominated in the study area. These results were similar to the study conducted by Sati and Song (2011) in Montane mainland of Uttarakhand, Himalayas and they found that fodder and fuel wood withdrawal and consumption varied with location, regions and also with slopes. In general, easy availability and less distance to be covered for collection were the main reasons for the higher consumption of crop residue and green fodder in the study area.

Table 2 Share of different fuel types in terms of their usage in the study area.

S.No.	Type of fuel	Total fuel used used (kcal/month)	% utilization
1.	LPG	4.5×10 ⁶	4.04
2.	Kerosene	1.8×10 ⁶	2.02
3.	Wood	27.7×10 ⁶	86.53
4.	Dung cake	2.6×10 ⁶	7.40
	Total	36.6×10 ⁶	

Fuel consumption pattern

The major fuel type consumed in the study area was fuel wood, liquefied petroleum gas, dung cake and kerosene oil. The consumption of different types of fuel in the study area is given in Table 2. The total fuel consumption in the study area was calculated to be 36.6x10⁶ kcal/month. The highest share among

different fuels used was found to be of fuel wood (86.53%), followed by dung cake (7.40%), LPG (4.04%) and kerosene oil (2.02%). Easy availability of dry wood from nearby hills was an important factor behind the excess use of fuel wood while the lowest consumption of kerosene oil can be attributed to the use and availability of other energy sources in the study area. The present work was found in line with the study conducted by Singh and Sundriyal (2009) in Patharkot Village of Almora district of Uttarakhand, where fuel wood was the only form of energy for cooking due to poor economic condition of people and easy availability of firewood from nearby forests. It was also observed that the fuel wood extraction was highest in winter as compared to summer season, which was similar to the study conducted by Rawat and Sharma (2010) in district Rudra Prayag of central Indian Himalayas.

Common fuel and fodder species

In the study area, *Acacia nilotica*, *Dalbergia sissoo*, *Melia azadirachta*, *Toona ciliata*, *Bombax ceiba*, and *Eucalyptus* were the preferred species as fuel wood and as a fodder *Albizia lebbeck*, *Morus alba*, *Grevia optiva*, *Triticum aestivum*, *Zea mays*, green grass were the most preferred species.

CONCLUSION

Agricultural activities, working as labourers and selling milk were found to be the main employment sources for the inhabitants of the study area. The major fuel type consumed in the study area was fuel wood. Increasing population would demand more fuel wood indicating that there might be more pressure on nearby forests. Thus, appropriate measures e.g. regeneration and eco-development of degraded forests and providing alternative interventions like electrification, subsidized LPG cooking etc. are needed for the protection and conservation of natural resources in the study area.

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