P: ISSN NO.: 2321-290X RNI : UPBIL/2013/55327 VOL-5* ISSUE-1* September- 2017
E: ISSN NO.: 2349-980X **Shrinkhla Ek Shodhparak Vaicharik Patrika**

Fuelwood Collection from Outer Himalayas: A Case Study of Kathua Forest Division

Sandeep Singh
Research Scholar,
Deptt.of Geography,
Jammu University
Jammu

Indhu Bhushan
Research Scholar,
Deptt.of Geography,
Jammu University
Jammu

Abstract

Bulk of India's population uses fuelwood to meet their daily requirements of cooking and heating. In the hills, especially in the villages, no alternative sources of energy are available and hence the people depend upon the nearby forests to meet their needs of fuelwood. In the Himalayan region, over 90% of the people living in the rural areas burn wood to cook food. This is usually obtained from the nearby forests. India is a rural based economy with lakhs of villages and thousands of cities. Both rural and urban populations are dependent on fuelwood for their requirement of fuel. The major source of biomass energy in India is fuelwood, agricultural waste and animal dung. An attempt has been made to evaluate the fuelwood collection from Kathua Forest Division. The Kathua forest division lies in the Jammu East circle of Jammu forest Region. It has three Ranges i.e. Kathua range, Jasrota Range and Samba Range. These three ranges are divided into 11 blocks and these blocks are further divided into 46 beats. The total area of Kathua forest division is 467. 24 Sq. km. It comprises of broad leaved mixed deciduous forest which provides a large scope for fuelwood. The fuelwood is used extensively throughout the study area but their percentage of usage varies as we move upward to the higher elevation.The study is purely based on primary data collected by filling up the questionnaires and simple statistical techniques are adopted for calculations. The study reveals that 96.66% households living in the study area use fuelwood with an average of 10.23kg/day/HH. It indicates the dependency of households on fuelwood living in the study area.

Keywords: Fuelwood, Himalayas, Economy, Obtained, Dependency.

Introduction

Fuelwood is any wooden material that is gathered and used for fuel. Generally, fuelwood is not highly processed and is in some sort of recognizable log or branch form, compared to other forms of wood fuel like pellets or chips. Fuelwood is renewable resource. However, demand for this fuel can outpace its ability to regenerate on local and regional level. Fuel wood is a fuel from wood products. It comes in various forms such as wood chips, logs, pellets, off cuts and saw dust. They can be used in wood stoves, district heating schemes, house boilers and for power generation providing both cheap heating and power and in particular for remote rural areas. The use of wood fuel has several benefits. As a consumer one can benefit from the use of wood fuel financially because it currently the cheapest heating option. The financial and environmental benefits are probably good enough reasons to switch to wood fuel but large scale replacement of fossil fuels by wood fuel would bring a number of benefits for the country as a whole as well.Fuelwood was the primary source of fuel until the 1800's when it was displaced by coal and later by oil. Today fuelwood is usually obtained from timber or trees unsuitable or unwanted for building or construction. Wood plays a marginal role in the energy supplies of the industrial countries, except in certain rural areas. But this is not the case in developing countries, where the vast majority of the people continue to depend on the fuel to which they traditionally have access wood.

Study Area

Geographically, Kathua forest Division is located between 32º 23' and 32º 44' N latitudes and 75º 2' and 75º 44' E longitudes with total area of 467.24 sq km (2011) in corporating and total pop of 170450 (2011). It has three Ranges i.e. Kathua range, Jasrota Range and Samba Range. It is a part of Shiwalik ecosystem. Forms in a a single macro-watershed as

most of the area drains into the Ravi River through numerous tributaries and khads. The elevation varies from 343 mts to 1276 mts from mean sea level. The Kathua forest division is economically important. Being mixed deciduous forests, they support a huge population of livestock of local landlords and nomadic grazers and Bamboo to cottage industries.

Objectives of the Study

1. To identify the tree species which are frequently used as fuel in the study area.
2. To evaluate the use of wood as fuel in order to understand the quantitative utilization of the forest resources in the study area.

Data Base and Methodology

The present study is based on both primary and secondary data. The secondary data has been collected from the published and unpublished records of the various departments like District statistical hand books, the various working plans of the Kathua Forest Division, , Forest statistical hand book of different years, wildlife department etc. For the collection of primary data the study area was divided into three zones on the basis of altitude i.e., zone I, lying between 300mts to 600mts, zone II lies between 600mts to 900mts and zone III lies 900mts and above. To make the study more precise various quantitative techniques and GIS software arc 9.3 was adopted to furnish graphs, diagrams, and tables for the visual representation of the data. The best representative respondents living with in the vicinity of forest were randomly selected.

Following are the quantitative techniques were used to study the different aspects of study,

Average

The averages were calculated to obtain the average of inter and intra zonal usage of forest resource in different ways. The average was calculated by the following formula:

$$\bar{X} = \Sigma X / N$$

Where, $\bar{X}$ = Mean or Average,

ΣX = Sum of all values,

N = No. of observations.

Correlation Analysis

The correlation analysis was done to understand the relationship between intra zonal variation in altitude and the usage of forest particularly in fuel wood and fodder according to different parameters like caste, income and distance from the surfaced road. The following formula is used

$$(r) = 1 - \frac{6\sum d^2}{N(N^2-1)}$$

Where, $d = R_1 - R_2$,

N= no. of variables

Results and Discussions

Fuelwood is renewable resource. However, demand for this fuel can outpace its ability to regenerate on local and regional level. Fuel wood is a fuel from wood products. It comes in various forms such as wood chips, logs, pellets, off cuts and saw dust. They can be used in wood stoves, district heating schemes, house boilers and for power generation providing both cheap heating and power and in particular for remote rural areas. The use of wood fuel has several benefits. As a consumer one can benefit from the use of wood fuel financially because it currently the cheapest heating option. Kathua forest division comprises of broad leaved mixed deciduous forest which provides a large scope for fuelwood. The fuelwood is used extensively throughout the study area but their percentage of usage varies as we move upward to the higher elevation. Out of 41tree species (see Annexure I) and 50 species of shrubs and herbs (Annexure II), found in Kathua forest division. The important species used as fuel in study area are as under:-

Table 1: Tree Species and Shrubs Used for Fuelwood in Kathua Forest Division

S. No.	Botanical name	Common Name	Family
1	*Acacia nilotica*	Kikar	Leguminacae-Mimoseae
2	*Acacia catechu*	Khair	-do-
3	*Acacia modesta*	Phulai	-do-
4	*Acacia farnesiana*	Exotic Acacia	-do-
5	*Aegle marmelos*	Bel	Rutaceae
6	*Lannea grandis*	Kamel	Anacardiaceae
7	*Broussonetia papyrifera (introduced)*	Paper Mulberry	Urticaceae
8	*Cassia fistula*	Amaltas/Karangal	Leg- caesalpinieae
9	*Dalbergia sissoo*	Shisham	Leg-papilionaceae
10	*Eucalyptus terecticornis (introduced)*	Hybrid Safeda	Myrtaceae
11	*Eucalyptus citriodora (introduced)*	Safeda	-do-
12	*Eucalyptus camaldulensis*	-Do-	-do-
13	*Syzygium cumini*	Jamun	-do-
14	*Ficus glomerata*	Rumbal	Urticaceae
15	*Grewia disperma*	Dhaman	Tiliaceae
16	*Melia azedarach*	Drek	Meliaceae
17	*Pinus roxburghii*	Chir Pine	Pinaceae
18	*Wendlandia exerta*	Pansar	Rubiaceae
19	*Ziziphus jujube*	Ber	Rhamnaceae
20	*Adhatoda vasica*	Brainkar	Acanthaceae
21	*Carrisia spinarum*	Garna	Apocynaceae
22	*Dodonaea viscose*	Santha	Sapindaceae
23	*Calotropis gigantia*	Aak	Solanaceae

Source: Based on Field Survey, 2012-13

Inter Zonal Analysis

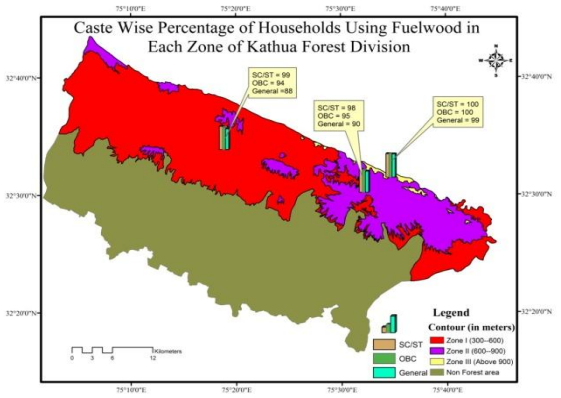
To make the study precise comparative analysis of fuelwood usage among three zones has been attempted. For the analysis three parameters such as caste, income, and distance from road have been taken into consideration. The households in all the three zones of the study areas are using fuelwood in their houses but the quantity used per household varies as we move from zone I to zone III.

Table 2: Caste Wise Utilization of Fuelwood in Each Zone of Kathua Forest Division

S.No.	Caste	Percentage of Households			Quantity of Fuelwood		
		Zone I	Zone II	Zone III	Zone 1	Zone II	Zone III
1	General	88	90	99	5.25	9.90	12.90
2	OBC	94	95	100	7.40	10.10	13.60
3	SC/ST	99	98	100	9.80	13.0	12.84

Source: Based on Field Survey, 2012-13

This table reveals that in zone I, 95% of the population use fuelwood, 96% in zone II and 99% in zone III. There is increasing percentage of population using fuelwood with increase in altitude. Out of the mentioned percentage in the three zones 88% of the general category, 94% of the OBC category and 99% of the SC/ST category households are using fuelwood as the energy source in zone I. It is 90% of general category, 95% of OBC category and 99% of the SC/ST category households used fuelwood in zone II. In zone III, 99% of the general category and 100% of the OBC and SC/ST categories households used fuelwood. It clearly indicates the dependency of the people living in the vicinity of forest for their need of fuel. The category wise quantity of fuelwood used per household in each zone of the study area is highlighted in the above table. A wide variation has been observed in the quantity used from 300mts to 1300mts amsl which ranges from 5.25kg/day/HH reflecting a range of 7.65kg/day/HH. In zone I, Households belonging to general caste use 5.25kg of fuelwood daily, for OBC it is 7.40 kg and for SC/ST it is 9.80 kg/day/HH. In zone II, the percentage of household used fuelwood increases to 9.90 kg/day/HH in case of general category, 10.10 kg/day/HH in case of OBC and 13.0 kg/day/HH in terms SC/ST categories. The quantity of fuelwood used increases as we move to zone III, it is 12.90 kg for general, 13.60 kg for OBC and 12.84 kg for SC/ST households.



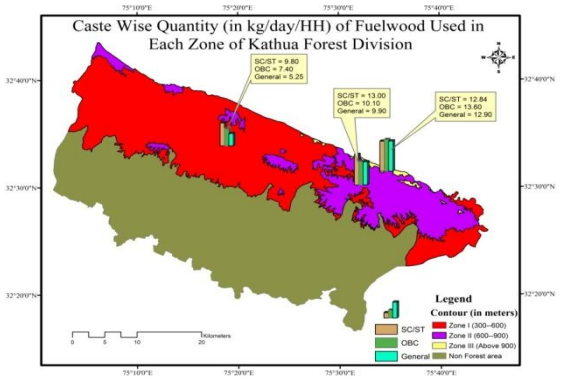


Table 3: Income Wise Percentage of Households Using Fuelwood in Each Zone

S.no.	Income (Rs. in Thousands)	Percentage of Households			Quantity of fuelwood		
		Zone I	Zone II	Zone III	Zone I	Zone II	Zone III
1	Less than10	100	100	100	9.90	13.85	14.03
2	10-25	98	100	100	9.05	13.80	14.21
3	25-40	90	90	100	5.85	6.85	14.41
4	Above 40	85	80	100	2.45	3.28	7.77

Source: Based on Field Survey, 2012-13

The above table reveals that in zone I, the percentage of households using fuelwood daily, decreases with increase in income. 100% of the households having lower income (less than Rs. 10, 000) used fuelwood for cooking, it is 98% for the households belonging to second income group (Rs.10, 000-25,000), 90% for the third income group (Rs.25, 000-40,000) and 85% for the households belongs to higher income group (more than Rs.40,000). In zone II, 100% of the households belong to lower income group (less than Rs, 10,000) and second income group (R. 10, 000-25,000) used fuelwood daily in their houses. In case of zone III, 100% of the household use fuelwood. This table indicates the fact that except from the income groups above 25 thousands in zone I and II, all the households from every caste and income group use fuelwood in their houses, which shows the dependency of the people on wood as fuel. The income wise quantity of fuelwood used in the study area is highlighted in the above table. It shows that the quantity of fuelwood used per day increases from zone I to zone III but decreases with increase in income. In the lower income group (less than Rs.10,000) from each zone, the quantity used per day increases as it is 9.90 kg per day/HH in zone I, 13.85

P: ISSN NO.: 2321-290X RNI : UPBIL/2013/55327 VOL-5* ISSUE-1* September- 2017
E: ISSN NO.: 2349-980X **Shrinkhla Ek Shodhparak Vaicharik Patrika**

Kg per day in zone II and 14.03 kg per day in zone III. For the households belonging to the second income group (Rs.10, 000-25, 000) the quantity used per day again increases from zone I to zone III. It is 9.05 kg daily in zone I, 13.80 kg in zone II and 14.21 kg in case of zone III. In the third income group (Rs.25, 000-40, 000) an average of 5.85kg per day fuelwood used per household in zone I, it is 6.85 kg per day in zone II and 14.41 kg in case of zone III. The households belonging to the higher income group (more than Rs. 40, 000), an average of 2.45kg per day is used in zone I, 3.28kg per day in zone II and 7.77 kg per day in case of zone III. It also indicates that with the increase in income the quantity of fuelwood used per household decreases in each zone but it also reflects the variation due to increase in altitude. The households belonging to the same income group in different zones shows variation in fuelwood consumption which indicates the total dependency of household on fuelwood for cooking as we move upward to the higher altitude. The main reason behind this is the easy availability of fuelwood in the higher zones.

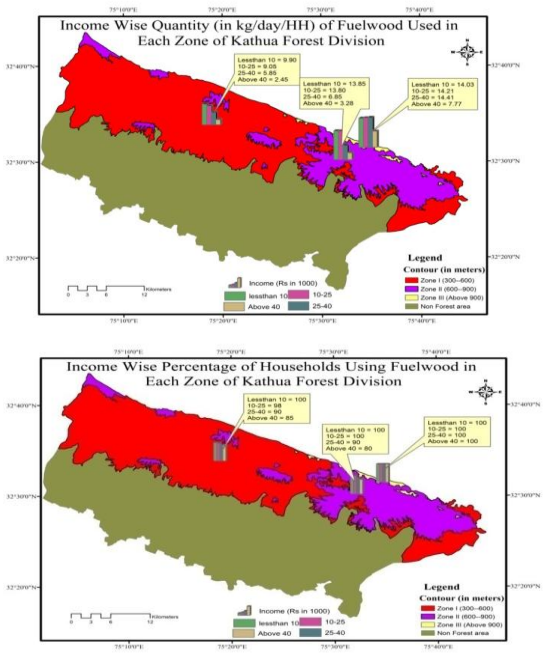
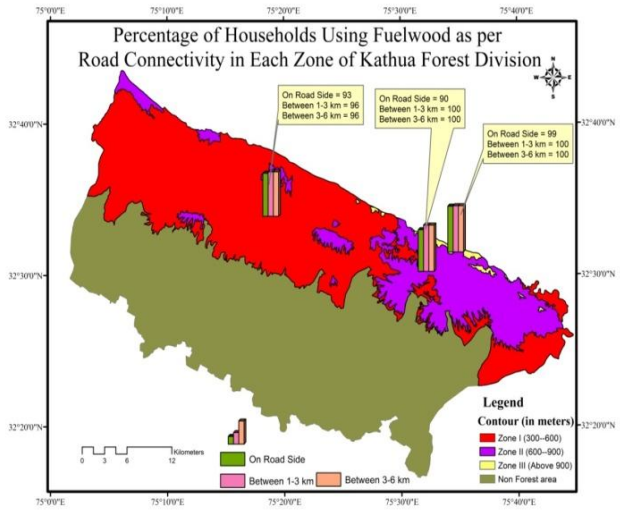


Table 4: Percentage of Households Using Fuelwood in Each Zone as per Road Connectivity

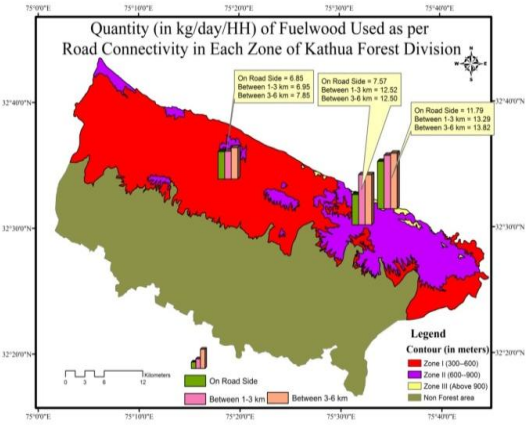
S.No.	Road Connectivity (in Kms)	Percentage of Households			Quantity of fuelwood		
		Zone I	Zone II	Zone III	Zone I	Zone II	Zone III
1	On roadside	93	90	99	6.85	7.57	11.79
2	Between 1-3	96	100	100	6.95	12.52	13.29
3	Between 3-6	96	100	100	7.85	12.50	13.82

Source: Based on Field Survey, 2012-13

The above table tends to reflect the road connectivity wise percentage of household using fuelwood in the study area. It shows that the households living on the road side of each zone use fuelwood with varying percentage. It is 93% households in zone I, 90% in zone II, and 99% in zone III. As we move away from the road, the percentage of households using fuelwood increases to 96% in zones I, and 100% in zone II and Zone III. It clearly indicates that the people living within the vicinity of forest are completely dependent on fuelwood for cooking and heating. The variation in the quantity used per day is discussed in the table below. The climate play a great role in the average quantity of fuelwood used at different altitudinal zones. The table below reflects that double the amount of fuelwood is required in zone III as compared to zone I because of the extreme cold conditions during winters As far as the quantity of fuelwood used per household in the study area is concerned the households living on the road side of each zone uses fuelwood at an average of 6.85 kg per day in zone I, 7.57 kg per day in zone II and 11.79 kg per day in zone III. As the distance of the households increases from the road, the quantity used per day also increases. For the households found between 1-3kms an average of 6.95 kg per day is used in zone I, 12.50 kg in zone II, and 13.82 kg in zone III. It clearly indicates that apart from zone I, where maximum modern facilities are available both the zone II and zone III are highly dependent on fuelwood for cooking and heating purposes hence the average quantity used per day/HH has almost doubled.



P: ISSN NO.: 2321-290X RNI : UPBIL/2013/55327 VOL-5* ISSUE-1* September- 2017
E: ISSN NO.: 2349-980X **Shrinkhla Ek Shodhparak Vaicharik Patrika**



Correlation Analysis

To find out the zone wise relationship between quantity of fuelwood used per day by the households in terms of income and distance from the road, Spearman's rank correlation method is used and following values have been calculated.

Table 5: Zone Wise Correlation Values

S. No.	Zone	Category	Correlation Value
1.	I	Income	-1
		Distance from road	+1
2.	II	Income	-1
		Distance from road	+1
3.	III	Income	-0.8
		Distance from road	+1

Source: Based on Field Survey, 2012-13

The relationship between the quantity of fuelwood used in the study area with the income and distance from the surfaced road is highlighted in the above table with the help of correlation technique. It reflects that there is a perfect –ve relationship found between the increase in income and quantity of fuelwood used meaning thereby that as the income of the households increases the quantity of fuelwood used per day decreases in each zone. On the other hand as the distance from the road side increases, the quantity used per day/HH also increases which reflects the perfect +ve relationship between quantity of fuelwood used with the increasing distance from the surfaced road.

Conclusion

Fuelwood collection the study reflects that in zone I, 95% of the population use fuelwood, 96% in zone II and 99% in zone III. In zone I, Households belonging to general caste use 5.25kg of fuelwood daily, it is 7.40 kg in case of OBC and 9.80 kg per day in case of SC/ST category which is 4.55kg/day/HH more than general category and 2.40 kg/day/HH more than OBC category. In zone II, the percentage of household used fuelwood increases to 9.90 kg/ day/HH in case of general, 10.10 kg/day/HH in case of OBC and 13.0 kg/day/HH in terms SC/ST categories. Further the quantity of fuelwood used increases as we move to zone III. It is 12.90 kg/day/HH for general, 13.60 kg for OBC category and 12.84 kg/day/HH for SC/ST category households. The study also shows that the quantity of fuelwood used per day increases from zone I to zone III but decreases with increase in income. In the lower income group (less than Rs.10,000) from each zone, the quantity used per day increases as it is 9.90 kg/day/HH in zone I, 13.85 Kg per day in zone II and 14.03 kg/day/HH in zone III. For the households belonging to the second income group (Rs.10, 000-25, 000) the quantity used per day again increases from zone I to zone III. It is 9.05 kg daily in zone I, 13.80 kg/day/HH in zone II and 14.21kg/day/HH in case of zone III. In the third income group (Rs.25, 000-40, 000) an average of 5.85kg/day/HH fuelwood used per household in zone I, it is 6.85 kg/day/HH in zone II and 14.41kg/day/HH in case of zone III. The households belonging to the higher income group (more than Rs. 40, 000), an average of 2.45kg/day/HH is used in zone I, 3.28kg/day/HH in zone II and 7.77 kg/day/HH in case of zone III. As far as road connectivity is concerned the households living on the road side uses fuelwood at an average of 6.85 kg/day/HH in zone I, 7.57 kg/day/HH in zone II and 11.79 kg/day/HH in zone III. As the distance of the households increases from the road, the quantity used day also increases. For the households found between 1-3kms an average of 6.95 kg/day/HH is used in zone I, 12.50 kg/day/HH in zone II, and 13.82 kg/day/HH in zone III. It clearly indicates that apart from zone I, where maximum modern facilities are available both the zone II and zone III are highly dependent on fuelwood for cooking and heating purposes hence the average quantity used per day/HH has almost doubled. The relationship between the quantity of fuelwood used in the study area with the income and distance from the surfaced road is studied with the help of correlation technique. It reflects that there is a perfect –ve relationship found between the increase in income and quantity of fuelwood used, on the other hand as the distance from the road side increases, the quantity used per day/HH also increases which reflects the perfect +ve relationship between quantities of fuelwood used with the increasing distance from the surfaced road.

References

1. *Negi, S.S. 1994. Indian forestry through the Ages, Indus publishing company, New Delhi.*
2. *Perttu Anttila, Timo Karjalainen and Antti Asikainen. 2009. Global Potential of Modern Fuelwood, finnish forest research institute, finland, Pp. 6*
3. *Sarma P.K. 1991. Forest Resource and their Utilization", Mittal Publications, Mohan Garden, New Delhi.*
4. *Sagreiya, K.P. 1967. Forests and Forestry, National book trust, India.*
5. *Westoy Jack. 1989. Introduction to World Forestry, Oxford, UK.*
6. *Wood as fuel, a guide to choosing and drying logs, Biomass energy centre,U.K.*
7. *World Energy Outlook 2006, Energy for Cooking in Developing Countries,pp.419*
8. *100 years of Indian forestry, 1861-1961; Forest research Institute, Dehra Dun. vol.1. Pp. 71*

9. *Anttila, Perttu, Karjalainen, Timo & Asikainen, Antti, 2009. Global potential of modern fuelwood, Finnish Forest Research Institute FI-01301 Vantaa, Finland.*
10. *Brodhead, J; Bahdon, J; and Whiteman, A. 2001. Woodfuel consumption modeling and results. Past trends and future prospects for the utilization of wood and energy. Working paper no. GFPOS/WP/05. Global forest outlook study, FAO, Rome.*
11. *Calen May-Tobin, The root of the problem-Wood for fuel, union of concerned scientists, 2011, page no. 3*
12. *Shukla, P.R. Biomass energy in India: transition from traditional to modern, Published in The Social Engineer, Vol. 6, No. 2. Page no. 2*
13. *Perttu Anttila, Timo Karjalainen and Antti Asikainen. 2009. Global Potential of Modern Fuelwood, finish forest research institute, Finland, Pp. 6*
14. *Wood as fuel, a guide to choosing and drying logs, Biomass energy centre, U.K.*
15. *Perttu Anttila, Timo Karjalainen and Antti Asikainen, 2009. Global Potential of Modern Fuelwood, Finnish forest research institute, Finland, page no.10*
16. *World Energy Outlook 2006, Energy for Cooking in Developing Countries,pp.419*
17. *Swaminathan, L.P. and Varadharaj, S. 2001. IUFRO,joint symposium on tree seed technology physiology and tropical silviculture.pp. 150-151.*
18. *Dr. Bernard O. Muok, Status report on use of fuelwood in India, M.S. Swaminathan research foundation, Chennai, India. Page no. 2*
19. *Swaminathan, L.P. and Varadharaj, S. 2001. IUFRO, joint symposium on tree seed technology physiology and tropical silviculture. pp. 150-151.*
20. *Shukla, P.R. Biomass energy in India: transition from traditional to modern, Published in the Social Engineer, Vol. 6, No. 2. Page no. 3*
21. *Devendra Pandy, fuelwood studies in India, myth and reality. Centre for international forestry research, Indonesia, 2002. Page no.1[1] Swaminathan, M.S. 2011. Bioenergy Resource Status in India, Research Foundation Chennai, India. Page no. 3*
22. *National sample survey organization, 2007-08. Energy used by Indian households, New Delhi, National sample survey organization, department of Statistics, report no. 530.*
23. *Jammu and Kashmir State Forest Policy, 2010. Pp 1-2*

Census and Statistical Hand Book

1. *Census of India 2001 and 2011.*
2. *Digest of Forest Statistics, JK Forest Department, 2011.*
3. *Progress Reports of various range officers.*
4. *Working Plan of Kathua Forest Division 1991, 2001 and present draft working plan.*

Annexure I

S. No.	*Botanical name*	Common Name	Family	S. No.	*Botanical name*	Common Name	Family
1	*Acacia nilotica*	Kikar	Leguminacae-Mimoseae	20.	*Cassia glauca (Introduced)*	Cassia	-do-
2.	*Acacia catechu*	Khair	-do-	21.	*Cassia siamea (Introduced)*	Cassia	-do-
3.	*Acacia modesta*	Phulai	-do-	22.	*Cedrela toona (Syn Toona ciliate)*	Tun	Meliaceae
4.	*Acacia farnesiana*	Exotic Acacia	-do-	23.	*Celtis australis*	Kharik	Urticaceae
5.	*Aegle marmelos*	Bel	Rutaceae	24.	*Chenopodium murale*	Karun	Chenopodiaceae
6.	*Albizzia lebbeck*	Kala Siris	Leguminacae-Mimoseae	25.	*Cinnamomum comphora*	Camphor	Lauraceae
7.	*Albizzia procera*	Safed Siris	-do-	26.	*Crataeca religiosa*	Barna	Bixaceae
8.	*Albizzia odoratissima*	Kramblu	Leguminacae	27.	*Dalbergia sissoo*	Shisham	Leg-papilionaceae
9.	*Artocarpus heterophyllus*	Katahal	Moraceae	28.	*Dendrocalamus strictus*	Bamboo	Graminae
10.	*Azadirachta indica*	Neem	Meliaceae	29.	*Diospyros coranona*		
11.	*Bambusa arundinacea*	Bamboo	Bambuseae	30.	*Ehretia laevis*	Chamror	Boraginaceae
12.	*Bambusa natans (cultivated)*	Bamboo	-do-	31.	*Ehretia acuminata*	Chamror	Boraginaceae
13.	*Bauhinia variegata*	Kachnar	Leg caesalpinieae	32.	*Emblica officinalis*	Amla	Euphorbieceae
14.	*Bauhinia purpurea*	Kachnar	-do-	33.	*Erythrina suberosa*	-	Leguminaceae Papilionaceae
15.	*Bombax ceiba*	Simbal	Malvaceae	34.	*Eucalyptus terecticornis (introduced)*	Hybrid Safeda	Myrtaceae

16.	*Broussonetia papyrifera (introduced)*	Paper Mulberry	Urticaceae	35.	*Eucalyptus citriodora (introduced)*	Safeda	-do-
17.	*Butea monosperma*	Dhak/Plash	Leg-papilionaceae	36.	*Eucalyptus camaldulensis*	-Do-	-do-
18.	*Cassia fistula*	Amaltas / Karangal	Leg-caesalpinieae	37.	*Syzygium cumini*	Jamun	-do-
19.	*Casearia tomentosa*	Chilla	Flacourtiaceae	38.	*Euphorbia royleana*	Thor	Euphorbiaceae
39.	*Ficus benghalensis*	Ber	Urticaceae	40.	*Ficus religiosa*	Pipal	
41.	*Ficus palmata*	Fagora	-do-	42.	*Ficus glomerata*	Rumbal	

Annexure II

S. No.	***Botanical Name***	**Common Name**	**Family**
1.	*Achyranthes aspera*	Parkanda	Amaranthaceae
2.	*Adhatoda vasica*	Brainkar	Acanthaceae
3.	*Aloe barbandensis*	Kuad gandal	Liliaceae
4.	*Aloe vera*	-	-d0-
5.	*Arrua scandens*	-	Amaranthaceae
6.	*Callicarpa macrophylla*	-	Verbinaceae
7.	*Calotropis procera*	-	Asclepiadaceae
8	*Cannabis sativa*	bhang	Urticaceae
9	*Capparis spinarum*	-	Capparidaceae
10	*Carrisia spinarum*	Garna	Apocynaceae
11	*Cassia tora*	-	Caesalpiniaceae
12	*Cassia occidentalis*	-	-do-
13.	*Centella asiatica*	Brahmi bhuti	Umbelliferae
14.	*Cirsium arvense*	Bhus	Asteraceae
15.	*Colebrookia oppositifolia*	-	Labiaceae
16	*Cynoglossum lanceolatum*	shudri	Borainaceae
17	*Cyperus compactus*	deela	Cyperaceae
18	*Datura fastuosa*	dhatura	Solanaceae
19	*Dialiptera bupleuroides*	Kalu grass	Acanthaceae
20	*Dodonaea viscosa*	santha	Sapindaceae
21	*Duranta plumeris*	duranta	Verbinaceae
22	*Fleminigia chapper*	-	Laguminaceae papilionaceae
23	*Gompherna colelosoides*	battani	Asteraceae
24	*Ipomoeo carnea*	Ah	Convolvuliceae
25	*Jatropha curcas(introduced)*	-	Euphorbiaceae
26	*Lantana camara(introduced)*	Panj phuli	Varbinaceae
27	*Lathyrus aspera*	Mithu grass	leguminaceae
28	*Loranthus spp*	-	Loranthaceae
29	*Malvastrum coromandelium*	Baryar	Malvaceae
30	*Murraya koenighii*	Drankli	Rutaceae
31	*Nerium odoratum*	Gandila	Apocynaceae
32	*Opuntia spp*	Chhiter thor	Cactaceae
33	*Parthenium hysterophorus*	Congress grass	Asteraceae
34	*Phoenix acaulis*	-	Palmae
35	*Pupalia lappacea*	Jajra	Amaranthaceae
36	*Punicaa granatum*	Anar	Lythraceae
37	*Randia dometorum*	-	Rubiaceae
38	*Reinwardtia indica*	Basant panchami	Linaceae
39	*Ricinus communis*	Arnid	Euphorbiaceae
40	*Sida cordifolia*	-	-
41	*Solanum nigrum*	Kayan kothi	Solanaceae
42	*Solanum erianthum*	Ban tabacoo	Solanaceae
43	*Tribulus terrestris*	Pakhra	Zygophyllaaceae
44	*Tulipa stillata*	Kayalu	-
45	*Taroxacum officinale*	Phul dudli	Asteraceae
46	*Urena Lobata*	-	Malvaceae
47	*Vitex negundo*	Bana	Verbinaceae
48	*Woodfordia fruticosa*	-	Lythraceae
49	*Woodfordia floribunda*	Dhain	Lythraceae
50	*Xanthium strumarium*	Jojra	Asteraceae