

# Wood consumption study Kodagu district

Origin of Cauvery

Forest Survey of India  
Bangalore



## Preface

The Wood Consumption Study in Kodagu District was conducted by the Forest Survey of India, Southern Zone, Bangalore during October-November 1995. As per this study, the annual requirement of timber for Kodagu District is 8,63,218cu.m. and that of firewood is 71,656 metric tons. The per capita timber consumption in rural and urban areas are 1.817 cubic metre and 1.266 cubic metre respectively. The per capita fuelwood consumption in these areas are 0.152 tons and 0.099 tons per annum respectively. There is a huge gap between the demand and supply of firewood in the district, which requires special attention of the district authorities. Some measures have been suggested in the report to bridge this gap. The study has also assessed the requirement of wood in the district by the end of the year 2001 A.D. and puts them at 8,91,987 cubic metre of timber and 74,033 tons of firewood. The necessary step may be taken to regulate the consumption of these commodities keeping in view the increasing population and carrying capacity of the forests of the district.

The survey work was carried out by the field party led by Shri G.S.Trivedi, Junior Technical Assistant, with Shri Thanasekar, Shri H.P.Ranganath, Shri B.H.N.Murthy, all Fieldmen and Shri P.Srirama, Driver, under the overall supervision of Shri Devendra Kumar, I.F.S. Deputy Director and Dr.B.Shivaraju, I.F.S., Joint Director. The data processing was done by Shri S.Sampath, Junior Technical Assistant. The report has been prepared by Sri .D.Nalini Mohan, I.F.S., Deputy Director and Dr.B.Shivaraju, I.F.S., Joint Director.

I thankfully acknowledge the co-operation extended by the officers and staff of Karnataka Forest Department for extending logistic support which was extremely helpful in timely completion of field work.

It is hoped that this report will help in strengthening the interests of conservation and will be useful to Forest Department and State Planners in planning developmental activities in the district.

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## Chapter-I

### 1.1 Introduction

Kodagu District of Karnataka is very rich in forest wealth. The project on the inventory of forest resources of the district was completed during the year 1994 and the report was published in 1995. To know the demand for wood within the district, wood consumption study was taken up in the district in the year 1995. The survey work was carried out from October 95 to November 95.

### 1.2 Objectives

The objectives of the wood consumption survey in Kodagu District were as follows:-

- ◆ To study the wood consumption pattern in relation to uses such as building construction, furniture, agricultural implements, fuel etc., in both rural and urban areas.
- ◆ To study the effect of household size and income levels on the consumption of wood.
- ◆ To study the variations in the wood consumption based upon the distance from the forests.
- ◆ To assess the total consumption of wood and bamboo at present in the district.
- ◆ To know the gap between the present demand and supply position.

### 1.3 Methodology

The village/town/city was the basic sampling unit. The entire survey area of the district was divided into three strata viz., A, B & C. A & B form part of rural areas while C comprises urban areas. Stratum 'A' consists of villages falling within the radius of 5 km from the forests while Stratum 'B' consists of villages falling beyond 5 km from the forests. 1.5% of the total villages in each stratum of the District was selected at random for data collection. Ten households representing different income groups in each selected village were picked up at random for data collection. In stratum 'C', the town/cities with population upto 50,000 and more than 50,000 were listed out. Five towns/cities were selected randomly from the list. In Kodagu district, no city is having population more than 50,000. Out of 9 towns, 5 were selected at random. Twenty households in each town were selected for data collection.

### 1.4 Income-Groups

Sampled households were classified into three income groups based on their annual income. The families having annual income upto Rs.20,000 were classified in lower income group while those having their annual income ranging from Rs.20,000 to Rs.50,000 and more than Rs.50,000 were grouped in middle and upper income groups respectively.

## 1.5 Growth Rate of Population

To project the per capita consumption and future demand of wood, the population growth was estimated by using the following formula:

$$A = P(1+r)^x$$

Where A = Population as per 1991 census.

P = Population as per 1981 census.

r = Annual rate of increase of population.

X = Time interval in years between successive census of population as well as households.

## 1.6 Data Collection

Field party led by Junior Technical Assistant and assisted by Fieldmen collected data from selected households in the selected villages. The data collected were in terms of quantity of timber utilized for building construction, furniture, agricultural implements, firewood consumption etc. The sample forms used for collection of data are given in the Appendix 'D'. Conversion factors, as given in the manual were used for assessing the quantity of timber used for different purposes. The forms were checked up at Headquarters and processed in Personal Computer.

## 1.7 Estimation of Consumption Pattern

The per capita consumption pattern of wood for various purposes was estimated using Arithmetic mean method for each stratum of sampled villages. It is derived by using the following formula

$$\text{Present consumption of wood for house construction for a district in Rural sector} = \frac{\sum x}{N} \times \text{District population of the rural sector}$$

where  $\sum x$  = Total existing usage of wood for selected houses in the sampled villages

N = Total No. of persons in the selected houses in the sampled villages.

## CHAPTER -II

### GENERAL DESCRIPTION OF THE SURVEY AREA

#### 2.1 Location

Kodagu District is located in the South-Western border of Karnataka State. It lies between 11°56' and 12°52' North latitude and 75°22' and 76°12' East longitudes. It is bound by Hassan district on the North, Mysore district on the East, Dakshina Kannada District on the West and Cannanore district of Kerala State in the South.

#### 2.2 Topography and Physical features

Situated in the Eastern and Western slopes of Western Ghat, Kodagu is a picturesque high land. The southern, western and north-western portions of the district are hilly while north, north-eastern and eastern portions contain undulating landscape. Towards the west, the summit of western ghats attain great height and the entire western portion of the district is an unbroken chain of hills. The highest peak of the district is Todiondamol with a height of 1908 meters above mean sea level.

The main drainage is eastwards. Cauvery is the main and the longest river of the district having its origin in the Brahmagiri mountains at a place called Talakaveri.

#### 2.3 Area and Population

The total geographical area of the district is 4102 sq.km. As per 1991 census, the total population of the district is 4,88,455 of which 84% is rural. The district has a population density of 119 per sq.km., literacy 58.49%, sex ratio 989 and decennial growth rate of population is 5.05%. The main work force comprises of about 45% of population, out of which 20.07% are cultivators, 15.18% are agricultural labourers, 0.93% are workers in household industry and 63.82% are other workers.

#### 2.4 Climate and Rainfall

The climate of the district is characterised by high humidity, heavy and very heavy rainfall and cool summer. Rainy season starts from June and continues till the end of September. Even during the months of October and November, certain parts of the district receive a good amount of rainfall. The period from December to February constitute the cold season marked by bright noons, foggy mornings and cool nights. March to May is summer season. During March, sporadic mild showers called blossom showers occur in all parts of the district. Occasional heavy showers in the month of May preceded by winds of high velocity and thunder storm are common.



## **2.5 Forests**

About one-third of the total geographical area of the district is classified as forest. Reserve Forest constitutes 1136.46 sq.km, which is under the absolute administrative control of the Karnataka Forest Department. In addition, there are large extent of uncultivated government lands which are also covered by dense forest vegetation. The forests of the district are Tropical Moist and Dry type (1A/C3, 1/2A, 3B/C2, 5A/C3). It is rich in wildlife. It supports a National Park and three wildlife Sanctuaries. The major fauna which are commonly found are tiger, panther, elephant, bison, wild boar, sloth bear, sambar, spotted deer, barking deer, wild dog, nilgiri langoor, lion-tailed macaque etc.

The forest of the district contains more than 200 tree species.

## **2.6 Socio-economic Features**

The economy of the district is dependent on forests. People depend upon forest for timber, fuel, honey collection, non-wood forest produce and also for employment. Forests are also the main source of fodder for cattle and manure for their plantation crops such as coffee, cardamom, orange and pepper. Paddy is the chief agricultural produce of the district.

Kodavas, the predominant community of Kodagu have a martial tradition and this district has the honour of producing many Army Generals.

## CHAPTER-III

### WOOD CONSUMPTION IN RURAL AREA - STRATUM A

#### 3.1 Selection of villages

At a sampling intensity of 1.5% altogether 6 villages were selected in Stratum 'A' for data collection. This stratum consists of villages falling within 5 km from forest areas. Ten households representing different income groups were selected in each village for data collection and data were collected in respect of various uses of wood in the format given in Appendix 'B'

#### 3.2 Wood Consumption Pattern in Stratum 'A'

Wood consumption pattern in 60 households of 6 sample villages were studied. The data were analysed. Per capita consumption of wood for various purposes for each of the sample village is derived by adding the wood used in the sampled houses divided by the total number of population in the sampled houses. Per capita consumption for the district is calculated by taking arithmetic mean of the villages. This figure multiplied by total no. of population in the district gives the quantum of wood presently used in the district. The various uses like house construction, furniture making, agricultural implements making, domestic consumption of fuelwood are also derived from this method. The details of per capita consumption of wood in Stratum 'A' are tabulated below.

Table-1  
Per capita Consumption of wood in Stratum - A

SLNo	Item	Unit	Quantity
1.	Building construction	M <sup>3</sup>	1.658
2.	Furniture	M <sup>3</sup>	0.090
3.	Agricultural implements	M <sup>3</sup>	0.023
4.	Total Timber	M <sup>3</sup>	1.771
5.	Firewood	Tons/annum	0.171
6.	Bamboo	No.	2.136

The pattern of wood consumption was also studied by considering different income groups as classified in para 1.1. The consumption pattern for different income groups are depicted in Table-2.

Table - 2

## Per capita Consumption of Wood in Stratum-A (Income Groupwise)

Sl.No	Item	Unit	Income group		
			Upper	Middle	Low
1.	Building construction	M <sup>3</sup>	1.842	1.855	0.929
2.	Furniture	M <sup>3</sup>	0.095	0.114	0.040
3.	Agricultural implements	M <sup>3</sup>	0.017	0.035	0.017
4.	Total Timber	M <sup>3</sup>	1.954	2.004	0.986
5.	Firewood	Tons/annum	0.168	0.179	0.166
6.	Bamboo	No.	4.045	0.157	1.038

The observations which can be made from the above table are:

1. The consumption pattern of timber indicates that per capita consumption of wood for construction and furniture is maximum in middle income group and minimum in low income group. Hence income level and availability of wood have no significant impact on the consumption pattern. Annual firewood consumption also increases from 0.168tons/annum in upper income group to 0.179tons/annum in middle income group and is minimum 0.166tons in low income group. This indicates upper income people of the district use more alternative sources of energy for heating purposes.
2. The total timber consumption in middle income group is almost double that of the low income group. The upper income group are also using more timber than the lower income group people. Since, the availability of timber is not a constraint in Kodagu district, it is only the income level that decides the consumption pattern. However it may be presumed that total (gross) consumption of wood by low income group population would be more than that of middle or upper income groups due to their higher number. People have not adopted the use of alternate sources of energy or wood substitutes proportionate with the improved levels of income possibly due to rural environment of the district.
3. Per capita bamboo consumption pattern does not show any correlation with income. Bamboos are used by both lower and upper income group of people. The middle income group use little bamboo. This may be due to the fact that low income people are living in a traditional houses in which bamboos are used in large quantities. People with middle income, due to increase in income are using semi-pucca and pucca houses which require less or no bamboo. Upper income group people are maintaining separate cattle sheds made of bamboos and thus consuming more bamboo. This group can afford to purchase bamboo for their domestic consumption.

## CHAPTER-IV

### WOOD CONSUMPTION IN RURAL AREA - STRATUM 'B'

#### 4.1 Selection of villages

The sample villages situated beyond 5 km from the forest areas are put in Stratum 'B'. 1.5% of the total of such villages of the district were selected as sample villages. Three villages were selected in this category for collection of household data and in each village, 10 household of various income groups were surveyed. The list of villages is given in Appendix 'A'.

#### 4.2 Wood consumption in rural area - Stratum 'B'

Per capita wood consumption for different uses was assessed by totaling the wood consumed for different purposes and dividing the sum arrived with the total no. of persons in the surveyed sample. The following table gives the pattern of wood consumption in Stratum B in Kodagu district.

Table-3

Per capita Consumption of wood in Stratum-B

Sl.No	Item	Unit	Quantity
1.	Building construction	M <sup>3</sup>	1.747
2.	Furniture	M <sup>3</sup>	0.167
3.	Agricultural implements	M <sup>3</sup>	0.009
4.	Total Timber	M <sup>3</sup>	1.923
5.	Firewood	Tons/annum	0.108
6.	Bamboo	No.	0.527

The per capita consumption of wood based on income groups in Kodagu district (Stratum B) was arrived at by using arithmetic mean method for each income group.

Table - 4

Per Capita Wood Consumption in Stratum - B (Income Group wise)

Sl.No	Item	Unit	Income group		
			Upper	Middle	Low
1.	Building construction	M <sup>3</sup>	1.504	1.427	2.310
2.	Furniture	M <sup>3</sup>	0.152	0.093	0.249
3.	Agricultural implements	M <sup>3</sup>	0.003	0.017	0.010
4.	Total Timber	M <sup>3</sup>	1.658	1.537	2.569
5.	Firewood	Tons/annum	0.075	0.078	0.175
6.	Bamboo	No.	0.597	0.326	0.000

#### The Observation:

It is evident from the above table that the per capita consumption of wood in low income group is higher compared to upper and middle income groups. The possible reasons could be 1. That the upper and middle income group has constructed pucca houses and wood consumption is less, but low income group are dependent on forest resources and consuming more wood for house construction purposes. 2. The upper and middle income group people are resorting to non timber furniture whereas lower income group are still using wood for furniture.

Only middle and upper income group people are using bamboo that too in their cattle sheds.

#### 4.3 Per capita consumption of wood in rural area (Stratum A+ B)

The following table shows the consumption pattern of wood in rural areas where the data of strata (A+B) is analysed in combined manner.

Table-5

Sl.No	Item	Unit	Quantity
1.	Building construction	M <sup>3</sup>	1.685
2.	Furniture	M <sup>3</sup>	0.114
3.	Agricultural implements	M <sup>3</sup>	0.019
4.	Total Timber	M <sup>3</sup>	1.817
5.	Firewood	Tons/annum	0.152
6.	Bamboo	No.	1.584

#### The Observation:

Per capita consumption of firewood in the combined stratum is 0.152 MT per annum which is considerably high. This is due to the fact that in Kodagu District, firewood is easily available and the people are using firewood for warming themselves to resist the cold climate as the district is having cooler climate for majority of the months.

After comparing the data of Stratum A & B (Table 1 & 3), it is seen that consumption of timber is not directly correlated to the factors of distance from the forest. On the contrary the per capita consumption of timber for various purposes is more in Stratum 'B' than in Stratum 'A'. This indicates that it is only the economy level and not just nearness to the forest which decides the consumption pattern of timber. But consumption pattern of firewood is affected by proximity of the forest area and per capita consumption in Stratum 'A' is about 1.63 times higher than that of Stratum 'B'. The availability of firewood and income level play significant role in deciding the pattern of consumption. The per capita consumption of firewood in stratum 'B' is less for middle and upper income groups as compared to that of Stratum 'A', but the per capita consumption of firewood in stratum B for lower income group is more or less same irrespective of the distance from the forest area. This is due to lack of alternative fuel and modern gadgets with the low income group in Kodagu district

The per capita consumption of bamboo in Stratum 'A' is more than that of Stratum B indicating that consumption pattern is affected by the factor of distance from the forest. Availability of bamboo also plays a significant role in deciding the pattern of consumption.

## CHAPTER - V

### WOOD CONSUMPTION IN URBAN AREAS AND IN ENTIRE DISTRICT

As per 1991 Census there are nine towns in the district. No city/town in the district has population more than 50,000. Out of 9 towns, 5 towns namely Madikeri, Kushalnagar, Sanivarsante, Somwarpet and Virajpet were selected as sample towns. Twenty households in each town were chosen for data collection and data were collected with respect to different uses of timber and firewood.

As per 1991 census, the urban population of the district rose to 77,941 from 71,663 in 1981 with an annual rate of growth of 0.843. With this growth rate, the urban population would be around 80,602 in 1995 and 84,766 in the year 2001. Average size of household has decreased from 4.92 in 1981 to 4.55 in 1991 and as per the existing trend of population growth and that of urban household it is estimated that in the year 1995 and 2001, the average size should be 4.4 and 4.22 respectively.

#### 5.1 Wood consumption in urban area

The data collected from 20 households from each selected town were analysed statistically by totaling the wood consumed by each household and dividing the sum by the total no. of persons in the sampled households of the village. Using the arithmetic mean method the per capita consumption of wood for various purposes were estimated. Table-6 indicates the consumption pattern of wood in stratum C.

Table-6

Per capita Consumption of Wood in Stratum 'C' (Urban Area)

Sl.No	Item	Unit	Quantity
1.	Building construction	M <sup>3</sup>	1.159
2.	Furniture	M <sup>3</sup>	0.124
3.	Agricultural implements	M <sup>3</sup>	0.002
4.	Total Timber	M <sup>3</sup>	1.266
5.	Firewood	Tons/annum	0.099
6.	Bamboo	No.	0.817

#### The Observation:

Per capita consumption of wood in the form of timber in Stratum 'C' is lower than that of Stratum A & B indicating that urban people have opted for substitute of wood in their uses. In Stratum 'C', still some wood is being used as agricultural implements, indicating that in this district still some portion of urban population depends upon agriculture for their livelihood.

Per capita consumption of firewood in this stratum is lowest being 0.099 MT/annum as compared to 0.171 MT and 0.108 MT per annum in Stratum A & B respectively. It indicates that although in urban area major source of fuel is still the firewood, there is increasing trend of use of alternative source of energy like electricity, kerosene oil, L.P.G. as fuel.

## 5.2 Comparison of wood consumption pattern in different strata

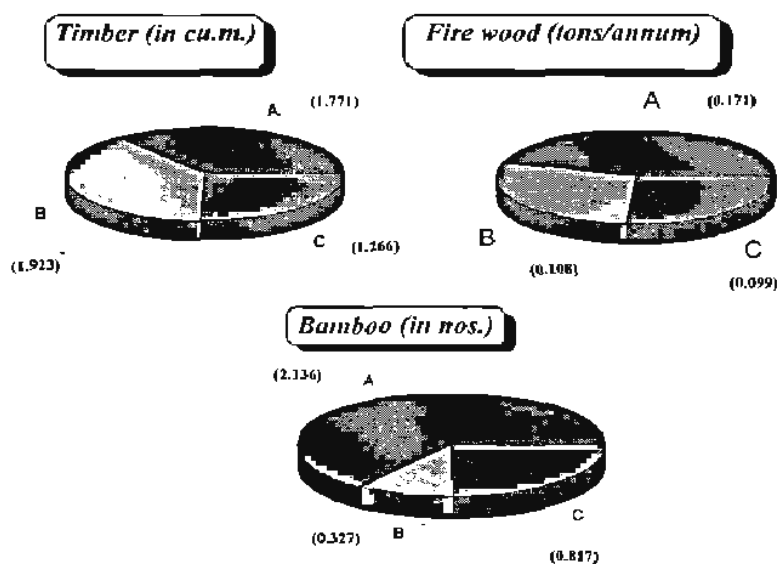
Table 7 indicates per capita wood consumption arrived by arithmetic mean method in three different strata irrespective of income of the household.

**Table - 7**

**Per capita Consumption of Wood in various Strata (A, B & C)**

Sl. No.	Item	Unit	Stratum A	Stratum B	Stratum C
1.	Building construction	M <sup>3</sup>	1.658	1.747	1.139
2.	Furniture	M <sup>3</sup>	0.090	0.167	0.124
3.	Agricultural implements	M <sup>3</sup>	0.023	0.009	0.002
4.	<b>Total Timber</b>	M <sup>3</sup>	<b>1.771</b>	<b>1.923</b>	<b>1.266</b>
5.	Firewood	Tons/annum	0.171	0.108	0.099
6.	Bamboo	No.	2.136	0.327	0.817

*Pie diagram showing the Percapita consumption of wood in various strata*



The trends of consumption pattern of the district in various strata can be summarized as below:

1. The nearness to the forest area does not play significant role in deciding the consumption pattern except that of firewood. Therefore it is the economy level and not the proximity of resource which plays an important role in deciding the consumption of timber. In case of firewood, the availability of material plays significant role and hence the consumption pattern is affected by the nearness to forest area.
2. Per capita consumption of timber in urban area is less than that of rural areas indicating that urban population have gone for substitute of wood in their building construction and other uses.

3. Per capita firewood consumption is less in urban area since alternate source of energy such as electricity, Kerosene oil, L.P.G. are available and are more in use.
4. In urban areas, wood is still in demand for making agricultural implements. It is observed that still some urban population depend upon agriculture for their livelihood. The present requirement of wood has been estimated on the basis of per capita consumption and estimated population of the district at the time of survey. The population estimate has been calculated by using the formula  $A = P(1+r)^x$  where A and P are population as per 1991 and 1981 censuses respectively and x is the time interval in years between successive census operations. The following table shows the population figures for rural (Stratum A+B) and urban (Stratum C) for the year 1981, 1991 and projected figure for 1995 and 2001.

**Table-8**

**Population Figures, Growth Rate and Estimation of Population by 2001 of Kodagu District**

S.No.	Item	1981 Census	1991 Census	Annual rate of growth	Estimate for 1995	Estimate for 2001
1.	Rural population	3,90,225	4,10,514	0.508	4,18,919	4,31,851
2.	Rural households	80,227	92,010	1.380	97,175	1,05,525
3.	Average size of Rural household	4.86	4.46	--	4.31	4.09
4.	Urban population	71,663	77,941	0.843	80,602	84,766
5.	Urban household	14,568	17,109	1.620	18,244	20,091
6.	Average size of Urban household	4.92	4.55	--	4.4	4.22

The present per capita consumption of total timber, firewood and bamboo based on this study can be summarized that the per capita total timber consumption for the rural and urban areas is 1.985 cu.m. and 1.301 cu.m. The results are tabulated as shown in table no.9

**Table-9**

**Per capita wood consumption by Rural & Urban Population**

S.No	Item	Unit	Rural	Urban
1.	Total timber	M <sup>3</sup>	1.817	1.266
2.	Firewood	Tons/annum	0.152	0.099
3.	Bamboo	No.	1.584	0.817



**Projections for 1995 -2001 A.D.:**

The total timber and firewood requirement in the district for 1995 and 2001 is summarised below (Table.10).

**Table-10**  
**Present timber and firewood requirement and projection of future requirement**

S.No.	Item	Unit	Stratum	1995	2001	Additional requirement in 6 years
1.	Timber	M <sup>3</sup>	Rural	7,61,176	7,84,673	23,497
			Urban	1,02,042	1,07,314	5,272
			Total	8,63,218	8,91,987	28,769
2.	Firewood	Tons/annum	Rural	63,676	65,641	1,965
			Urban	7,980	8,392	412
			Total	71,656	74,033	2,377
3.	Bamboo	Nos.	Rural	6,63,568	6,84,052	20,484
			Urban	65,852	69,254	6,402
			Total	7,29,420	7,53,306	26,886

In addition to the above requirement, the consumption for repairs/replacement to house, furniture, agricultural implements are to be taken into account. The following assumptions have been made in this connection after local investigation and based on our previous studies:-

1. The life of a house is assumed as 20 years and annual requirement of wood for construction of house and repairs would be 2% of the wood which is in use now.
2. Assuming the average life of furniture to be 25 years and 5% timber is replaced every year.
3. The average life of agricultural implements is about 10 years and about 10% timber is replaced every year.
4. Firewood collected is consumed during the year

The study reveals that Kodagu district, about 92.6% of the timber used was utilized for construction purposes, 6.34% for furniture and about 1% for agricultural implements in rural areas and where as in urban areas, about 90.08% of timber is used for building construction, 9.76% for furniture and 0.15% for agricultural implements.

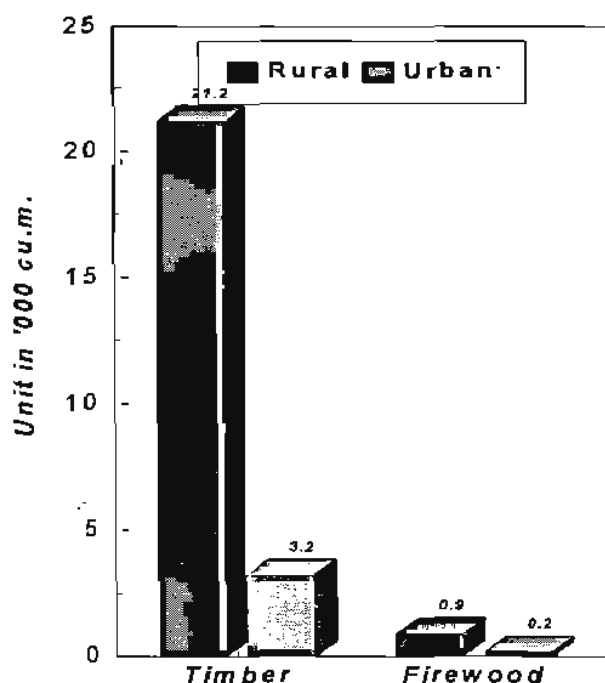
Using the above assumptions, the total quantity of wood required for annual replacement in house construction work will be 14,097cu.m. in the rural area and 1838cu.m. in the urban areas. At the rate of 5% annual replacement in case of furniture, the total quantity of wood required will be 2413cu.m. in rural area and 498cu.m. in urban areas. Similarly at the rate of 10% replacement for agricultural implements, the total quantity required will be 761cu.m. in rural sector and 15cu.m. in urban sector. The following table shows the estimated quantity of wood required annually for repairs and replacements for various items:

**Table-11**

**Quantity of wood required annually for repairs and replacement**

Sl.No	Item	Unit	Rural	Urban	Total
1.	Building construction	M <sup>3</sup>	14096.98	1838.39	15935.37
2.	Furniture	M <sup>3</sup>	2412.93	497.97	2910.9
3.	Agricultural implements	M <sup>3</sup>	761.18	15.31	776.49
4.	New Construction	M <sup>3</sup>	3916.17	878.67	4794.84
4.	<b>Total</b>	<b>M<sup>3</sup></b>	<b>21187.26</b>	<b>3230.34</b>	<b>24417.6</b>

*Bar diagram showing Annual requirement of wood*



In addition to the quantity required for repairs and replacement about 4,795 cubic meters of wood will be required annually for new house construction, furniture and agricultural implements due to growth in population. This is arrived at by dividing the total requirement of wood for 6 years i.e.,28,769cu.m. with 6 =4,794.83cu.m. / annum

Thus the total requirement of timber of the district comes to 24,417.6 cubic meter per annum. Annual consumption of firewood at the present rate comes to 71,656 MT which would increase to 74,033 MT in 2001 A.D. Average increment of firewood requirement would be 396MT/annum

### 5.3 Production of Wood in Kodagu District

Data regarding production of wood in Kodagu District were collected from Deputy Conservator of Forests, Madikeri and Virajpet Forest Divisions. The production statistics of last three years are as follows:-

**Table -12**  
**Production Statistics of Wood in Kodagu District**

Sl.No	Item	Unit	1992-93	1993-94	1994-95
1.	Timber	M <sup>3</sup>	76,297.883 (71,357.423)	1,24,224.371 (1,17,442.737)	86,523.243 (82,148.506)
2.	Firewood	M <sup>3</sup>	81,362.139 (70,532.179)	1,40,379.059 (1,28,226.179)	77,234.143 (76,058.715)
		Tons	29,057.906	50,135.378	27,583.622
3.	Charcoal	Tons	272	241	2.04
4.	Bamboo	No	23,104	24,416	18,355
5.	Poles	No	99,247	1,37,424	51,590

The figures in the brackets indicate production from private land which is included in total production.

\* (1 ton firewood = 2.8 m<sup>3</sup> stacked)

### 5.4 Import and Export Data of the District

The following table shows the import and export data of last three years.

**Table-13**  
**Table showing the Import and Export of Wood**

Items	Unit	Import			Export		
		1992-93	93-94	94-95	1992-93	93-94	94-95
1. Timber	m <sup>3</sup>	Nil	Nil	Nil	36,347.389	72,510.479	39,055.100
2. Firewood	m <sup>3</sup>	Nil	Nil	Nil	42,755.171	51,395.000	41,252.400
	*Tons	Nil	Nil	Nil	15,269.703	18,355.357	14,733.000
3. Charcoal	Ton	Nil	Nil	Nil	Nil	Nil	Nil
4. Bamboo	No.	Nil	Nil	Nil	Nil	Nil	Nil
5. Poles	No.	Nil	Nil	Nil	Nil	Nil	Nil

\* (1 ton firewood = 2.8 m<sup>3</sup> stacked)

### 5.5 Net available wood for consumption within Kodagu district:

Taking into account the production, export and import of wood in the district, the net quantity of wood and bamboo available for consumption within the district has been worked out and is depicted in table No. 14.

Table-14

## Net available wood for consumption within Kodagu District

Item	Unit	1992-93	1993-94	1994-95	Average of last 3 years
1. Timber	m <sup>3</sup>	39,950.494	51,713.892	47,468.143	46,377.509
2. Firewood	m <sup>3</sup>	38,606.968	88,984.059	35,981.743	54,524.256
	*Tons	13,788.702	31,780.021	12,850.622	19,472.948
3. Charcoal	Tons	272	241	204	239
4. Bamboo	No.	23,104	24,416	18,355	21,958
5. Poles	No.	99,247	1,37,424	51,590	96,087

\* (1 ton firewood = 2.8 m<sup>3</sup> stacked)

**The Observations are as follows:**

1. The average annual production of timber in Kodagu district is 95,681 cu.m. of which 49,304 cu.m. has been exported outside the district leaving behind 46,377 cu.m. of timber for consumption within the district.
2. The annual requirement of timber in Kodagu district is 24418 cubic meter for various purposes such as building construction, furniture and agricultural implements, the average availability is 46,377 cubic meter of which 94% is obtained from private lands.
3. The average annual timber production of the district is 95,681 cubic meter of which 90,316 cubic meter are produced in private areas and 5,365 cubic meter are produced from Government forest. Major quantity of timber requirement of the district is met with from tree cover found on private lands.
4. The annual requirement of fuel wood is 71,656MT, where as supply is only 19,473.MT leaving an alarmingly large gap.
5. Although fuel wood production is on an average 35,592 MT considerable portion of it is exported outside the district. Out of total firewood production 92% comes from private areas.
6. The huge gap of 52,183 MT between demand and supply is difficult to be explained on the basis of available official records. It appears that demand is met with from unrecorded firewood removed from the forest, in charge of the Government and also from other tree growth found on Government and private lands.
7. The details of firewood brought in head loads are not available.
8. The consumption of kerosene per person per annum in rural area stratum A, stratum B and urban area of the district is only 10.7 liters, 7.4 liters and 22.0 liters respectively which is very low.
9. Similarly use of alternative sources of energy such as L.P.G. , solar energy etc., is also very limited in the district. Thus resulting in heavy pressure on the forest for firewood.

## 5.6 Conclusion

The following conclusions may be drawn based on the study and the data supplied by local forest officials.

The total growing stock of Karnataka forests is 27,24,11,000 cubic meter with an annual increment of 55,74,000 cubic meter which is about 2% of the growing stock, Forest Survey of India, Dehradun. As per the report on Inventory of Forest Resources of Kodagu district published by Forest Survey of India, Southern Zone, Bangalore in the year 1995, the total growing stock of forest of Kodagu district is 31,785,400 cubic meter. The annual increment at the rate of 2% comes to be 6,35,708 cubic meter. The annual requirement of timber of the district is 24,418 cubic meter and that of firewood is 71656 MT or 2,00,637 cubic meter (1 ton = 2.8 m<sup>3</sup>). Thus net requirement of wood for the whole district comes to 2,25,055 cubic meter which is well below the annual increment of the forests of the district.

## 5.7 Suggestions:

The following suggestions are made based on the study results.

1. An intensive study may be initiated by the Karnataka State Forest Department to assess the extent of timber, firewood and bamboo removed from the state owned forests.
2. As there is a huge gap between the demand and supply in case of firewood, there is urgent need to popularise the alternate sources of energy for consumption so that the firewood requirement can be reduced considerably. This in turn will reduce the pressure on forest resources and there by improving the regeneration and stocking.
3. There is need to popularise wood substitutes for construction and furniture making purposes, so that the green cover in the district can be conserved for posterity.

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APPENDIX - A

List of sampled villages and towns for data collection

Sl. No.	Name of the village	No of households selected	Total No of persons in the selected households
<i>STRATUM - A</i>			
1.	Chennapura	10	79
2.	Doddakodli	10	101
3.	Dundahalli	10	51
4.	Hebbatgeri	10	47
5.	Horohalli	10	40
6.	Nellaji	10	65
<i>STRATUM - B</i>			
1.	Danugala	10	70
2.	Kirgur	10	45
3.	Nallur	10	53
<i>STRATUM - C</i>			
1.	Kushal nagara	20	105
2.	Madikeri	20	93
3.	Sanivarsanthe	20	94
4.	Somwarpet	20	113
5.	Virajpet	20	130

APPENDIX-B  
DOMESTIC WOOD CONSUMPTION  
(DATA COLLECTION FORM)

SCHEDULE-A

District:

Division:

Name of the owner of the house:

1. S.No. of the Stratum/Town.
2. Name of village/S.No. of Block
3. S.No. of Households.
4. Type of Building actually visited as a sample unit.  
Kutchha/Pucca/Multi-storied.
5. No. of stories total and used for living only (to be filled in if more than one storey).
6. Serial No. of the Building out of the total building to be visited in the village.
7. Ward No. House No. in Municipal area and cities wherever available.
8. No. of households living in the building.
9. Total number of persons living in the household.
10. Average annual income of the family. Nature of occupation (Service/cultivation/Business).
11. Average plinth area occupied by each house includes verandah covered by roof and floor.
12. (a) No. of living rooms.  
(b) No. of storage rooms.  
(c) No. of common rooms.  
(d) Other category viz., bath rooms, latrines, Kitchen, cow-shed etc.

Camp:

Date:

Signature.....

Name of Surveyor: .....

Designation: .....

**FORM 1(A)**

**EXISTING USE OF WOOD FOR HOUSE CONSTRUCTION**

*YEAR OF CONSTRUCTION:*

S.No	Item	Size (LxBxW)	Quantity of wood used in m <sup>3</sup> (sawn wood.)	Source forest/ Market	species used.
1.	Door				
2.	Windows				
3.	Roof				
	Poles				
	Ballies				
	Beams				
	Rafters				
	purlin				
	Parata				
	Plankings				
	Reapers				
	Supporters				
4.	Ventilators				
5.	Floorings				
6.	Others (Bamboos etc.)				

Note: Doors and Windows include the frame and panels.



**FORM 1(B)**  
**EXISTING FURNITURE ITEMS**  
*YEAR OF MANUFACTURE:*

S.No	Item	Nos.	Size	Approximate quantity of Sawn wood in m <sup>3</sup>	Sp. used	Source of Supply
1.	Chairs					
2.	Tables					
3.	Wooden Almirah.					
4.	Cots					
5.	Others (Specify)					
	(a)					
	(b)					
	(c)					

\*Such as Cane, Bamboo, Reed etc.

**FORM 1(C)**  
**AGRICULTURAL IMPLEMENT**

Sl.No.	Item	No.	Size	Quantity of wood used in m <sup>3</sup>	Source of Supply.	Species used.
1.	Plough					
2.	Yoke					
3.	Bullock cart					
4.	Leveler					
5.	Tool handles (Axes, Sythe Spal. etc.)					
6.	Winnower					
7.	Persion Wheels					
8.	Others specify.					

**FORM-1(D)**  
**FUEL CONSUMPTION PER ANNUM**

Sl.No.	Item	Cooking	Heating	Lighting	Total
1.	Firewood (qtl)				
2.	Agri. Waste (qtl)				
3.	Cow-Dung (qtl)				
4.	Gas (Kg)				
5.	Charcoal (qtl)				
6.	Coal (qtl)				
7.	Kerosene (ltr)				
8.	Electricity (units)				

**FORM NO. II**  
**FUEL CONSUMPTION**

S.No.	Category	Source of supply
1.	Firewood	
2.	Agricultural Waste	
3.	Animal Dung	
<i>Schedule-B (General)</i>		
1.	Type of equipment used	Ordinary Chula/Smokeless Chula/ Bio gas.
2.	Education level of the village.	
3.	Approach facilities	
4.	Service facilities	Hospital, School etc.

Camp:

Signature:

Date:

FORM NO. III

OTHER FOREST PRODUCE USED IN THE HOUSEHOLD

S.No.	Item	Qty./Kg./Year	Source of supply
1.	Thatch Grass		
2.	Fencing Branch wood		
3.	Green manure		
4.	Fencing thorn		
5.	Fodder by lopping		
6.	Fodder Grass		
7.	Others		