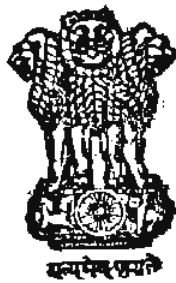




GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT AND FORESTS
(DEPARTMENT OF ENVIRONMENT, FORESTS & WILDLIFE)

**REPORT
ON
WOOD CONSUMPTION SURVEY OF
CHICKAMAGALUR DISTRICT
(KARNATAKA)**

FOREST SURVEY OF INDIA
SOUTHERN ZONE
BANGALORE
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P R E F A C E

A wood consumption survey is a necessary ingredient of a timber inventory. While a timber inventory makes qualitative and quantitative assessment of the growing stock and the net annual increment, a consumption survey ascertains consumption pattern and compares supplies with demand.

This special study of the wood consumption survey in Chickamagalur district of Karnataka was carried out in 1985-86 after completion of the timber inventory in 1984-85. The survey reveals that during 1985-86 the total consumption of timber, bamboo and fuelwood in the district was 40,183 m³, 33,450 tonnes and 11,25,664 m³ respectively. Besides 1,70,075 m³ timber, 3,812 tonnes bamboo, 1,25,291 m³ fuelwood and 551 tonnes charcoal was exported from the district. The total recorded production of timber, bamboo, fuelwood and charcoal in the district are 4,12,610 cu.m., 4,071 tonnes, 2,14,820 m³ and 551 tonnes respectively. The combined figures of local consumption and export from the district in respect of bamboo and fuelwood are more than production. The situation needs to be seriously looked into by the district forest administration.

The report has been prepared by Shri C.S. Vedant, Deputy Director with the help of his staff, who deserve commendation.

We hope that this report will be found useful in planning and implementation of forestry programmes in the district. Suggestions for the improvement in the report are welcome.

J.B. Lal
Director
Forest Survey of India

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(i)
S u m m a r y

A wood consumption survey was conducted in Chickamagalur district to collect wood production and consumption statistics. The survey was conducted in 1986-87 by the Southern Zone of the Forest Survey of India with its headquarters at Bangalore. This survey was conducted as a sequel to the growing stock inventory of the forests of the district. 1,014 households were selected from 112 villages in the rural sector and 164 households from 5 towns in the urban sector. The intensity of this survey is 5.8%. The results of the survey are summarized below.

(i) The per capita annual wood and bamboo requirement in the district is:

Sl. No.	Item	Unit of measurement	Rural		Urban		Overall	
			Per capita	SE%	Per capita	SE%	Per capita	SE%
1.	House construction	m ³	0.69	6.4	0.436	9.0	0.657	5.8
2.	Furniture	m ³	0.032	12.6	0.052	12.3	0.035	10.2
3.	Agricultural implements	m ³	0.033	7.3	0.006	22.7	0.030	6.9
4.	Bamboo	kg	77.768	4.8	20.000	25.6	77.000	4.77
5.	Fuelwood	m ³	1.088	4.0	1.104	7.8	1.09	3.6

(ii) The present annual consumption of wood & bamboo in the district with 1981 as base year is:

Sl. No.	Item	Unit of measurement	Present annual consumption
1.	House construction	'000 m ³	31.755
2.	Furniture	'000 m ³	0.93
3.	Agricultural implements	'000 m ³	7.498
4.	Fuelwood	'000 m ³	1,125.664
5.	Bamboos	'000 tonnes	33.450

(ii)

(iii) It is estimated that on the average about 1.032 million cubic metres of wood is cut directly from the forests by the people. This represents a loss of growing stock of the forests in the district at the rate of slightly more than 4 cu.m. per hectare per year. The havoc caused by this rate of exploitation will deplete the forests earlier than expected given the exponential rate of growth of population.

CHAPTER-1
INTRODUCTORY.

1. Introduction

Wood extracted from forests for the consumption of rural and urban population and for industries is a drain on the growing stock of the forests. In the scenario that exists in our rural and some of the semi-urban areas a part of the wood is extracted by Forest Department and supplied to some of the consumers while a much larger quantity, it is suspected, is extracted by the people themselves directly from the forests. While extractions done by the Forest Department and other agencies specifically permitted to enter forests to extract forest produce are recorded, no estimates of the quantity of forest produce extracted by people directly from the forests are available. Hence it becomes necessary to sample the rural and urban population directly to assess the demand and consumption of wood for different uses.

A timber inventory in the forests of Chickamagalur district had preceded this survey. As no timber inventory is complete without an estimate of the wood consumed by rural, urban and industrial consumers, this survey was therefore organised in the district in 1985-86 after completion of the timber inventory (1984-85). The results of this wood consumption survey have also been included in the timber inventory report of Chickamagalur and Hassan Districts.

2. Objectives of the Survey

The objectives of the wood consumption survey are enumerated below:

- 2.1 To study the dynamics of production of wood and bamboos in the survey area
- 2.2 To assess the pattern of wood and bamboo consumption in rural and urban households and industries
- 2.3 To study the consumption of wood with respect to the distance of the village from the forest.

For the conduct of this survey in the field an operational manual approved by the Director, Forest Survey of India, Dehradun (circulated vide No.14-2/85(F)-7409 dated 22.7.85) has been used. This manual contains details of the methodology of the survey. Hence the methodology of the survey is not narrated in this report. The interested reader may approach the Joint Director, Forest Survey of India, Southern Zone, P.O. Box No 4036, Vijayanagar, Bangalore 560 040 and obtain a priced copy of the manual which will be supplied by V P P

CHAPTER-II

BACKGROUND INFORMATION

1. General Description of the Survey Area

Chickamagalur district lies between $12^{\circ} 55'$ and $13^{\circ} 54'$ North latitudes and $75^{\circ} 05'$ and $76^{\circ} 22'$ East, longitudes. A major part of the district falls in the Western Ghats tract. The total area of the district is $7,200 \text{ km}^2$.

2. Population

The district has a population of 9,11,769 (1981 Census) with a population density of 126 persons per km^2 . The rural population of the district is 7,51,890 (82%). The decennial population growth rate in the district is 23.8%.

3. Forests

The total extent of the forests in the district as planimetered from the Survey of India toposheets (1:50,000) is 2953.99 km^2 , constituting about 41% of the geographical area. The legal status wise break up is given below:

Reserved Forest	:	$1,522.13 \text{ km}^2$
Protected Forest	:	38.54 km^2
Unclassed Forest	:	$1,393.32 \text{ km}^2$
		<hr/>
		$2,953.99 \text{ km}^2$

Out of $2,953.99 \text{ km}^2$ the extent of area actually under tree vegetation is $2,209.34 \text{ km}^2$. The average standing volume per hectare in these forests is about 79 cu.m.

Thus the total standing growing stock in the forests of the district may be about 1,74,53,786 m³ ± 5.6%. These figures are based on the results of the inventory of forest resources of Chickamagalur and Hassan districts conducted by the Forest Survey of India, Southern Zone, Bangalore in 1984.

The forests are typical of western ghats with evergreen to semi-evergreen vegetation on the mountain ranges where the maximum precipitation occurs. Deciduous to dry deciduous scrub forests are found in the rain shadow areas of Tarikere and Kadur taluks.

4. Market Centres

Koppa, Chickamagalur, Kadur and Tarikere are the main centres for timber trade and saw milling activity. There are about 43 saw mills and other allied wood based industries in the district. Government Timber Depots at Kadur and Tarikere were once major timber depots but due to restrictions being imposed on clear felling and extraction of timber from the forests in general, the importance of these two timber depots has declined. The privately established saw mills however continue to do business which obtain timber from private lands and coffee estates.

CHAPTER-III

ANALYSIS AND DISCUSSION OF THE RESULTS

3.0 'Per Capita Wood Consumption in Rural and Urban Sectors'

Estimates of wood consumed have been made for different uses such as house construction, furniture, agricultural implements and fuelwood separately for the rural and urban populations.

While wood and bamboo used for house construction, furniture and agricultural purposes by a person lasts a certain length of time ranging from 50 to 100 years in the case of wood used for dwelling houses, 50 years for furniture and 5 to 10 years for agricultural implements, that used for cooking and heating has to be replenished every day. Bamboos used in agriculture and households are probably replaced once in 2 years. Hence the per capita wood and bamboo used for house construction, furniture and agricultural implements is termed as "per capita wood and bamboo requirement." Per capita wood used as fuelwood, however, continues to be termed as "per capita fuelwood consumption." Since new dwelling units are being constructed to house the increasing population, the wood and bamboo consumed for constructing new houses, making new furniture and agricultural implements is calculated on the basis of per capita requirements and the estimated annual increase in the population. Table 3.0.1 below gives the per capita wood and bamboo requirement for house construction, furniture and agricultural implements in the rural and urban sectors and the entire district taken as a whole.

Table 3.0.1
Per Capita Wood and Bamboo Requirement

Item of consumption	Unit of measurement	Rural		Urban		Overall	
		Per capita	SE%	Per capita	SE%	Per capita	SE%
House Construction	cu.m.	0.690	6.38	0.436	8.99	0.657	5.84
Furniture	cu.m.	0.032	12.58	0.052	12.34	0.035	10.24
Agricultural implements	cu.m.	0.033	7.26	0.006	22.74	0.030	6.88
Bamboos	kg	77.768	4.77	20.000	25.64	77.000	4.77

The following table gives the per capita fuelwood consumption in the district.

Table 3.0.2
Per Capita Annual Fuelwood Consumption

Item of consumption	Unit of measurement	Rural		Urban		Overall	
		Per capita	SE%	Per capita	SE%	Per capita	SE%
Fuelwood	m ³	1.088	4.0	1.104	7.83	1.09	3.61

3.1 Present Annual Consumption of Wood and Bamboos

Projection of the population growth has been made using the simple geometric growth model using the formula

$$P_t = P_0 (1 + r)^t$$

where P_0 and P_t are the present and future populations and r the annual rate of growth as estimated from the decennial rate of growth. Using this model the decadal increase in the population of the district was calculated from which the average annual increase in population was derived.

In order to establish the wood consumption scenario the following assumptions are found to be necessary to make:-

- (i) 1981 is taken as the base year for all computations.
- (ii) That wood and bamboo consumption pattern does not change appreciably in the course of the decade.
- (iii) That substitutes to wood for construction, agriculture and cooking are not widely used/available.
- (iv) The average age of a dwelling unit is found to be 33 years. It is therefore assumed that after 33 years it is rebuilt with new timber.
- (v) 3% of the existing dwelling units (as in 1981) are pulled down and rebuilt every year.
- (vi) The average life of furniture used in a household is 50 years and 1/2 % of the existing furniture (in 1981) is condemned for new ones.
- (vii) The average life of agricultural implements is 10 years. 50% of the bamboos and 25% of the wood used in agricultural implements (in use in 1981) are replaced every year.

Based on the above the following table indicates the annual wood and bamboo consumption picture:

Table 3.1.1

Present Annual Wood and Bamboo Consumption Scene.

Base year	Average annual population increase (1981-1991)	Item of consumption	Unit of reference	Total quantity consumed in the district
1981	21,991	House construction	'000 m ³	31.755
		Furniture	'000 m ³	0.930
		Agricultural implements	'000 m ³	7.498
		Bamboos	'000 tonnes	33.450

Table 3.1.2

Estimated Annual Fuelwood Consumption Scene

Average Annual Population in the decade (1981-1991)	Total Quantity Consumed in the district (thousand cu.m.)
10,32,720	1,125.664

3.2 Wood Consumption Gradient

It was believed that wood consumption would generally be higher in households nearer to the forest areas than in those at a distance from the forest. To test this hypothesis the villages were categorised into 4 strata depending upon the distance of the village from the nearest forest; 0 to 3 km, 3 to 6 km, 6 to 9 km and beyond. The average consumption of wood for different uses was separately worked out for each stratum and is given in the following table:

Table 3.2.1

Item of consumption	Stratum A 0-3 km		Stratum B 3-6 km		Stratum C 6-9 km		Stratum D 9 km & beyond	
	Qty. (m ³)	SE%	Qty. (m ³)	SE%	Qty. (m ³)	SE%	Qty. (m ³)	SE%
House construction	1.224	13.1	0.617	8.1	0.497	6.1	0.475	12.5
Furniture	0.062	26.0	0.029	10.5	0.020	11.4	0.021	17.4
Agricultural implements	0.026	13.8	0.039	6.3	0.038	20.5	0.030	10.8
Fuelwood	2.085	3.9	0.958	6.8	0.904	11.21	0.485	12.9
Bamboos (tonries)	0.089	10.6	0.054	12.8	0.074	11.32	0.096	10.9

It can be seen from the above table that consumption of wood whether for construction, furniture, agricultural implements or fuelwood shows a statistically significant decline as the distance of the village from the forest increases.

3.3 Production of Wood and Bamboos in the District

Wood production statistics pertaining to both Government and private producers which are available with the Deputy Conservators of Forests of the concerned divisions in the district, have been collected. The following table gives at a glance the wood and bamboo production statistics of the district.

Table 3.3.1

Particulars of wood	Unit of measurement	1983-84	1984-85	1985-86
Timber	'000 m ³	100.884	94.761	412.61
Firewood	'000 m ³	101.440	191.052	214.82
Charcoal	'000 tonnes	1.349	1.657	0.551
Bamboos	'000 tonnes	2.227	9.258	4.071

A part of the wood and bamboos produced in the district is exported out of the district to other centres of consumption. Table 3.3.2 below gives details of the wood exported out of the district.

Table 3.3.2

Export of Wood from the District

Item of Export	Unit of measurement	1983-84	1984-85	1985-86
Timber	'000 m ³	73.363	84.891	170.075
Firewood	'000 m ³	58.200	43.045	125.291
Charcoal	'000 tonnes	1.349	1.657	0.551
Bamboo	'000 tonnes	1.840	8.529	3.812

3.4 Unrecorded Production of Wood

Net availability of wood and bamboo for consumption within the district is obtained by subtracting from the wood and bamboo production data the net quantity exported out of the district. Table 3.4.1 shows the net quantity of wood and bamboo available for consumption within the district after export.

Table 3.4.1

Net Wood Availability for Consumption within the District

Particulars of wood	* Unit of measurement	1983-84	1984-85	1985-86
Timber	'000 m ³	27.521	9.870	242.535
Firewood	'000 m ³	43.240	148.007	89.529
Charcoal	'000 tonnes	-	-	-
Bamboo	'000 tonnes	0.387	0.729	0.259

The entire quantity of charcoal produced in the district is exported out. The district is seen to be generally self-sufficient in respect of timber. It is also seen that against the estimated total consumption of fuelwood in the district which is of the order of 1,125,000 cu.m. the recorded production of fuelwood was only 101,440 cu.m. in 1983-84; 91,502 cu.m. in 1984-85; and 214,820 cu.m. in 1985-86. After export the net quantity of fuelwood available for internal consumption was 43,240 cu.m. in 1983-84; 148,007 cu.m. in 1984-85; and 89,529 cu.m. in 1985-86. It would not be incorrect to assume that the unrecorded production of fuelwood, i.e., the fuelwood collected by the people directly from forests and other lands is of the order of 1,032,072 cu.m. or 1.032 million cu.m. per year.

It has been estimated that the forests of Chickamagalur district have an average growing stock of about 79 cu.m. per hectare. The enormity of the fuelwood consumption can be gauged from the fact that the people of the district are clearing wood from an equivalent of 13,064 hectares of forests every year to meet their fuel requirements. It would be more appropriate to think of the removal of fuelwood by the people to be distributed over the entire extent of the tree clad forest area, i.e., 2,209.34 km² or 2,20,934 ha. It is thus seen that the depletion of growing stock of the forests in the district would be of the order of 4.7 cu.m./ha. If the growing stock depletion due to fuelwood collection goes on at this rate we should expect the results of this havoc to be readily noticeable when we carry out a reinventory of the forests of Chickamagalur district after 10 years, say in 1994.

A P P E N D I C E S

Sampled Villages for Data Collection in Rural Sector

STRATUM 'A'

Sl. No.	Name of the village	Village population 1981 census	Total No. of households in the village	Total No. of households selected	Population of households selected
1.	Agoli	-	-	10	55
2.	Chavaki	-	-	8	59
3.	Dugal	-	-	10	62
4.	Harekoppa	-	-	10	53
5.	Hulihalli	689	118	10	73
6.	Jambavalli	-	-	7	59
7.	Ambalur	-	-	4	17
8.	Bhadra	-	-	10	52
9.	Bedagar	672	92	4	27
10.	Bannur	1835	368	10	67
11.	Baiskara	-	-	5	25
12.	Cowanahalli	464	95	10	51
13.	Doddane	-	-	4	40
14.	Golugodu	-	-	8	57
15.	Hebbige	278	54	10	67
16.	Horakodage	-	-	5	43
17.	Karkikanda	-	-	10	43
18.	Elandur	-	-	10	72
19.	Malinganadu	526	97	10	68
20.	Ganjigeri	235	47	10	69
21.	Bachiganahalli	334	71	8	51
22.	Bhasapura	508	102	10	55
23.	Kandalkal	-	-	10	48
24.	Begaru	560	103	10	58
25.	Heggantota	87	16	3	11
26.	Ketumaranahalli	918	156	10	89
27.	Gollarhatti	-	-	10	79
28.	Madapura	1176	197	10	87

Sampled Villages for Data Collection in Rural SectorSTRATUM 'B'

Sl. No.	Name of the village	Village population 1981 census	Total No. of house-holds in the village	Total No. of house-holds selected	Population of house-holds selected
1.	Kattedagadda	-	-	3	28
2.	Gullanapete	-	-	10	108
3.	Janige	-	-	10	73
4.	Palguni	1136	232	10	70
5.	Gejjagongana-halli	832	138	10	75
6.	Hirekanavangala gala	759	116	10	96
7.	Javur	1019	150	10	110
8.	Andanahalli	-	-	10	81
9.	Bettada-tavarakere	787	122	10	97
10.	Dodgatta	269	56	9	70
11.	Dogehalli	265	41	10	70
12.	Gallarahalli	-	-	10	68
13.	Hunsagatta	2203	370	10	83
14.	Hosatimmapura	152	29	3	18
15.	Karehalli	273	56	9	61
16.	Narsipura	1403	210	10	55
17.	Nerlakere	1703	278	10	81
18.	Tippagondana-halli	290	52	10	78
19.	Vaderahalli	319	52	10	74
20.	Bandihalli	-	-	7	43
21.	Gonakallu	1256	291	5	22
22.	Halenahalli	-	-	10	77
23.	Kubbakere	450	72	10	62
24.	Masavinakatti	200	32	10	64
25.	Gujjenahalli	-	-	10	61
26.	Hanumantapura	69	14	10	70
27.	Shingatagere	2115	382	10	93
28.	Udregere	1600	287	10	82
29.	Shankaranahalli	83	16	10	69

Sampled Villages for Data Collection in Rural Sector

STRATUM 'C'

Sl. No.	Name of the village	Village population 1981 census	Total No. of house-holds in the village	Total No. of house-holds selected	Population of house-holds selected
1.	Handi	810	155	10	74
2.	Kode Madakal	171	36	8	34
3.	Kirugunde	446	96	10	54
4.	Kachhalli	-	-	8	54
5.	Mullundi	-	-	10	50
6.	Makana	-	-	10	44
7.	Murudanakere	-	-	10	45
8.	Nagalur	-	-	10	51
9.	Attimage	724	153	9	61
10.	Kurubarahalli	112	21	10	57
11.	Nagavangala	1244	232	10	96
12.	Yarehalli	161	26	10	73
13.	Erehalli	-	-	7	67
14.	Hanchihalli	749	140	7	53
15.	Kurubarakere	-	-	10	75
16.	Lakshmipura	-	-	8	64
17.	Uppalli	1781	302	5	35
18.	Dondune	-	-	9	96
19.	Rangapura	160	27	8	77
20.	Chikkanallura-halli	1476	247	10	81
21.	Chikkannana-koppalu	-	-	10	73
22.	Guddehalli	542	93	10	82
23.	Lambanihatti	-	-	10	73
24.	Yagati	2521	446	10	97
25.	Kottigenahalli	292	40	10	69
26.	Mallaghatte	1259	222	10	81
27.	Sananahalli	109	19	10	60
28.	Tippanakatti	-	-	10	84

Sampled Villages for Data Collection in Rural SectorSTRATUM 'D'

Sl. No.	Name of the village	Village population 1981 census	Total No. of house-holds in the village	Total No. of house-holds selected	Population of house-holds selected
1.	Butanike	165	33	10	42
2.	Buskal	619	128	9	67
3.	Chattenahalli	147	30	8	50
4.	Kammargodu	1530	324	10	41
5.	Nandipur	457	92	10	60
6.	Sigulli	-	-	5	23
7.	Basavapura	493	86	9	70
8.	Chikballekere	1094	161	9	79
9.	Dasarahalli	656	119	9	80
10.	Gallarahatti	-	-	9	56
11.	Gollarahatti	260	39	8	78
12.	Hanumanahalli	272	43	10	59
13.	Hanumanahalli	574	120	10	80
14.	Kamanakere	1003	178	10	73
15.	Kanagandanahalli	514	96	9	99
16.	Macheri	1432	225	10	75
17.	Mallidevihalli	565	116	10	84
18.	Mavinahalli	113	14	9	59
19.	Malleswara	755	135	10	101
20.	Mallapura	-	-	10	59
21.	Nagadvanahalli	12	4	10	94
22.	Gundusagara	657	112	10	70
23.	Hanumanahalli	283	45	9	57
24.	Lakkenahalli	539	98	10	74
25.	Lakkenahalli-hatti	125	21	10	74
26.	Lingalpura	11	5	10	95
27.	Panchehoshalli	666	104	10	59

Appendix-V

Statement of Households Selected for Data Collection
in Urban Sector

Sl. No.	Name of the town	Total population (1981)	Total No. of households	No. of households sampled	Total population of sampled households
1.	Chickamagalur	60582	10,227	94	620
2.	Tarikere	23929	3,926	40	303
3.	Ajjampura	7693	1,247	10	73
4.	N.R. Pura	6102	1,081	10	61
5.	Koppa	4759	865	10	57
	Total	103065	17,346	164	1,114

Appendix-VI

Population Statistics of Chickamagalur District

Census Year	Total	Rural Sector	Urban Sector
1961	5,97,305	5,07,833	89,472
1971	7,36,647	6,21,569	1,15,078
1981	9,11,769	7,51,890	1,59,879
1991 Projected	11,31,681	9,09,561	2,22,120
2001 Projected	14,08,887	11,00,296	3,08,591

Appendix-VII

Production and Utilisation of Wood in Chickmagalur District

Sl. No.	Category	Unit	1983-84				1984-85				1985-86			
			Total Production	Supply from the district to outside places	Available for consumption within district	Total Production	Supply from the district to outside places	Available for consumption within district	Total Production	Supply from the district to outside places	Available for consumption within district	Total Production	Supply from the district to outside places	Available for consumption within district
1.	Round Timber	000 M ³	100.884	73.363	27.521	94.761	84.891	9.870	412.610	170.075	242.535			
2.	Firewood	000 M ³	101.440	58.200	43.240	191.052	43.045	148.007	214.820	125.291	89.529			
3.	Charcoal	000 tonnes	1.349	1.349	-	1.657	1.657	-	0.551	0.551	-			
4.	Bamboo	000 tonnes	2.227	1.840	0.387	9.258	8.529	0.729	4.071	3.812	0.259			

Appendix-VIII

Wood Available for Industrial Consumption from Chickmagalur District

Sl No.	Category	Unit	1983-84				1984-85				1985-86			
			Plywood	Paper mill (pulp)	Others	Total	Plywood	Paper mill (pulp)	Others	Total	Plywood	Paper Mill (pulp)	Others	Total
1.	Roundwood	000 M ³	4.007	29,236	-	33.243	4.420	-	-	4.420	3.150	6.085	-	9.235
2.	Firewood	"	3.385	-	4.225	7.610	2.125	24.300	31.248	2.765	1.152	-	3.917	
3.	Total (1+2)	"	7.392	29,236	4.225	40.853	6.545	4.823	24.300	35.668	5.915	7.237	-	13.152
4.	Bamboo	000 tonnes	-	1.316	-	1.316	-	7.874	-	7.874	-	1.911	-	1.911

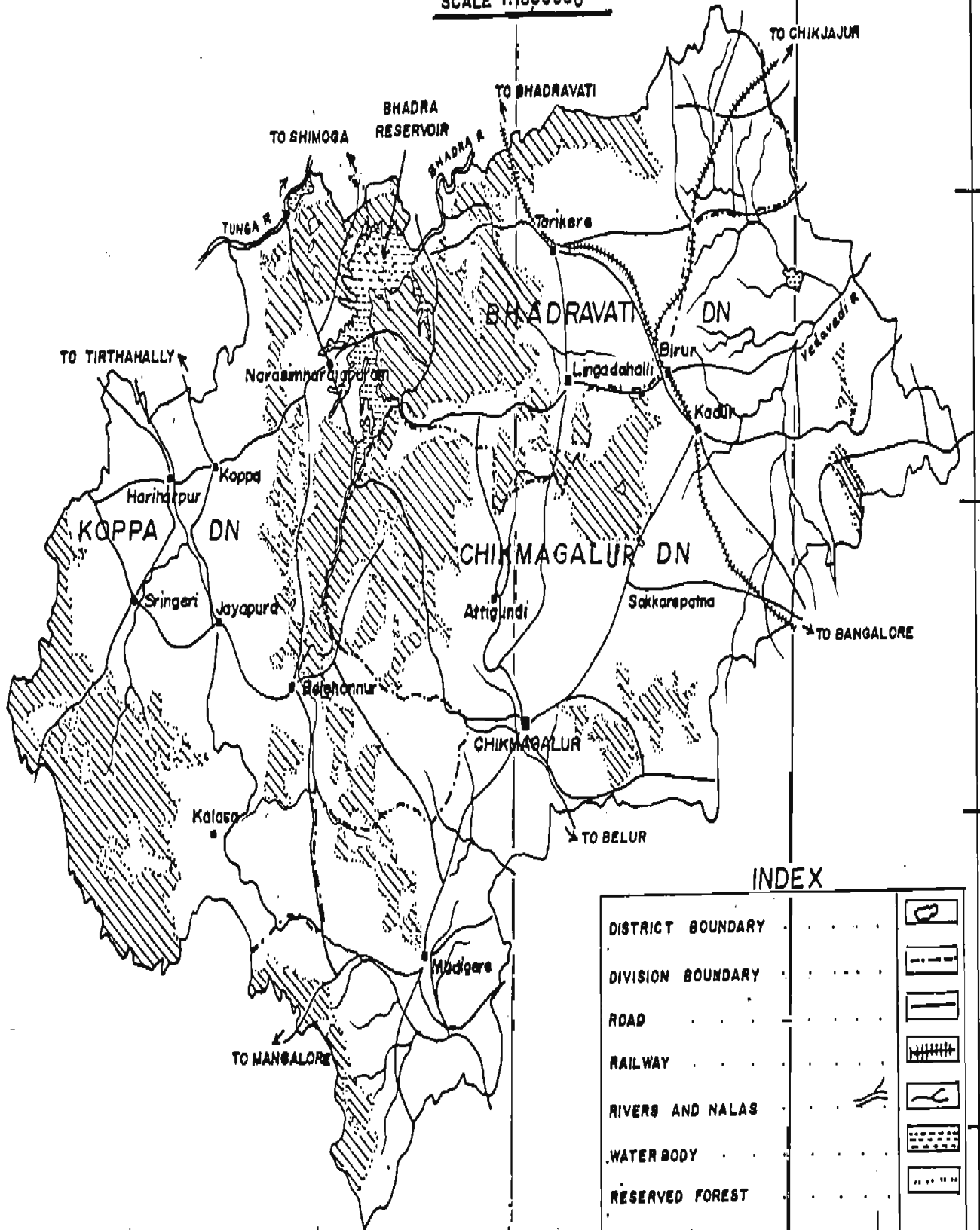
Appendix-IX

Present Per Capita Annual Consumption of Wood in Chickmagalur District

Sl. No.	Category	Unit	Rural Sector		Urban Sector		Overall for the Distt.	
			Consumption	SEX	Consumption	SEX	Consumption	SEX
1.	House Construction	M ³	0.690	6.38	0.436	8.99	0.657	5.84
2.	Furniture	M ³	0.032	12.58	0.052	12.34	0.035	10.24
3.	Agricultural implements	M ³	0.033	7.26	0.006	22.74	0.030	6.88
4.	Firewood	M ³	1.088	4.00	1.104	7.83	1.090	3.61
	Total	M ³	1.843	-	1.598	-	1.812	-

FOREST MAP OF CHICKAMAGALUR DISTRICT

SCALE 1:800000



INDEX

DISTRICT BOUNDARY	
DIVISION BOUNDARY	
ROAD	
RAILWAY	
RIVERS AND NALAS	
WATERBODY	
RESERVED FOREST	

78° 15' 30' 45' 78° 10' 15' H.M.V.

B i b l i o g r a p h y

1. Anon District Census Handbook,
 Town and Village Directory.
2. Anon Draft Report of Inventory of
 forest of Shimoga District.
3. Shrivastava, O.S. A Text Book of Demography.
4. Snedecor & Statistical Methods.
 Cochran

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