



सत्यमेव जयते

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

**REPORT
ON
WOOD CONSUMPTION STUDY
IN
SHIMOGA DISTRICT
[KARNATAKA]**

FOREST SURVEY OF INDIA
SOUTHERN ZONE
BANGALORE
APRIL, 1989

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P R E F A C E

Wood Consumption Survey has become an integral part of the timber resource inventory. The timber resource inventory on one hand gives a picture of the existing stock qualitatively as well as quantitatively. On the other hand the consumption survey indicates the consumption pattern and compares supply with the demand.

The wood consumption survey in Shimoga District was conducted during 1983-84. The survey reveals that the consumption of wood during the year was 11,68,150 M³ of which 11,00,000 M³ is of fire wood and 67,600 M³ is of round timber. The production of wood during the year 1982-83 is about 40,000 M³ of round wood, 38,800 M³ of fire wood and a bamboo production of about 19,000 tonnes. The estimated additional requirement of round wood and fire wood by 1990-91 is to the tune of 82,000 M³ and 13,63,000 M³ respectively and the same in 2001 would be 98,600 M³ and 16,60,000 M³. As the production of wood in the district is much less than the consumption, it has to be closely monitored.

The staff of Forest Survey of India, Dehradun and that of Southern Zone, Bangalore deserve commendation for their efforts in compiling the report.

Dehradun,
Dated 4.4.89.

J.B. Lal,
Director,
Forest Survey of India.

CHAPTER-I

1. Introduction

This study was undertaken to ascertain with as much accuracy and details as possible the present level of wood consumption in Shimoga district of Karnataka State. The Forest Survey of India, Southern Zone took up the work of field inventory data collection during 1983-84. Since no data pertaining to wood consumption was available with the State Forest Department, the headquarters of the Forest Survey of India has undertaken this task with the following objectives:

2. Objectives

- 2.1 To prepare the account of the level of wood consumption in the household sector in rural as well as urban areas for the purposes such as:
 - House construction.
 - Furniture making.
 - Agricultural implements.
 - Fuel wood needs.
- 2.2 To assess the total present consumption of wood and bamboo in the district.
- 2.3 To study the gap between the present demand and supply position.
- 2.4 To predict the future demand and suggest ways to meet the same.

For this study detailed information about the economic background of the district has been obtained and analysed.

CHAPTER-II

1. General Description of the Study Area

Shimoga district is situated in the western part of Karnataka State. The district lies between $13^{\circ} 27'$ and $14^{\circ} 39'$ North Latitudes and between $74^{\circ} 38'$ and $76^{\circ} 40'$ East Longitudes. The district is mostly hilly with western ghat hills. The total area of the district is $10,553 \text{ km}^2$ and average altitude is 640 metres above the M.S.L. The district has two revenue sub-divisions consisting of 11 Talukas. There are three Forest Divisions headed by Deputy Conservator of Forests with headquarters at Sagar, Shimoga and Bhadravathi.

2. Population

The population of the district as per 1981 census is 16.57 lakh forming 4.5% of the State's population with density of 157 persons per square kilometer. Of the total population 12.32 lakh are residing in rural sector and 4.25 lakh in the urban sector. The decennial growth of population has been 27.36%. The literacy level is about 44%.

3. Climate

The climate of Shimoga district is warm tropical with three distinct seasons viz; summer from March to May, winter from December to February and rainy season from June to November. The district receives major portion of rainfall from South-West monsoon. The average rainfall per year is about 1479 mm.

4. Vegetation

The district has 3,269.32 km² area under forest cover which is 30.99% of the total geographical area of the district.

The details are as follows:-

- Reserved Forests	.. 1,944.88 km ²
- Protected Forests	.. 1,289.28 "
- Unclassed Forests	.. 21.57 "
- Village Forests	.. 13.59 "
Total	.. <u>3,269.32 "</u>

(Source:- The Annual Administration Report of Forest Department: 1981-82.)

The vegetation consists of moist deciduous to semi-evergreen forests.

5. Market and Demand

Shimoga, Sagar and Bhadravathi are the main markets for wood. There are about 100 saw mills. The sawn products are consumed locally. The demand for wood is for various purposes such as; (i) house construction; (ii) furniture making; (iii) agricultural implements; (iv) fuelwood for cooking, heating etc. Bamboo is also used for constructional purposes.

There are some important major industrial units in the district such as:-

- i) Visweshwaraya Iron & Steel Ltd., Bhadravathi.
- ii) Mysore Paper Mills, Bhadravathi.
- iii) Cement Factory, Bhadravathi.
- iv) Thung Bhadra Sugar Mills, Shimoga.
- v) Mysore Sandal wood oil factory, Shimoga.

The wood is supplied to some of these industries details of which are given elsewhere in the report.

CHAPTER - III

1. Methodology

In rural areas the wood is used for house construction, furniture, agricultural implements, fuel needs. In urban areas wood is used for house construction, furniture and fuel purposes. Separate study has been conducted for rural as well as urban sector.

1.1 Rural Sector

A list of villages was prepared from the census of India conducted in 1981. From each Taluka 4 villages were selected at random without replacement. The selection was made in such a way that the villages away from the forest as well as the villages near the forest get due representation. In this way 36 villages were selected randomly out of 1795 which comes to 2%. The field data was collected by selecting 5 to 8 households at random in each village. A total of 189 households out of 1,76,006 were selected for data collection purposes. The field data was collected in the prescribed form.

1.2 Urban Sector

In Shimoga district there are 13 towns with population above 50,000, out of which 2 towns namely Shimoga and Bhadravathi were selected randomly. 20 households from Shimoga town and 21 households from Bhadravathi town were randomly selected. In all, 41 households were selected for data collection on wood consumption for various purposes.

1.3 Data Collection

The toposheets supplied by the Forest Survey of India, Southern Zone were used for locating the villages for their approaches from camps etc. Field data was collected by putting a minimum number of relevant questions to the interviewers. The data was collected for wood consumption for various purposes such as construction of houses, furniture, agricultural implements and fuel-wood. The format for data collection is given as Appendix-A.

1.4 Method of Estimation

For the purpose of estimating per capita consumption of wood the Regression method of estimation has been adopted. The estimate of mean wood consumption per household is calculated by using the formula:

$$\hat{Y}_{reg} = \bar{Y} + t (X - \bar{X})$$

where t = Regression coefficient;

\bar{X} is average number of persons per household in the population.

Variance has been calculated as:

$$\hat{V} (\hat{Y}_{reg}) = \frac{N - n}{N} \frac{S_e^2}{n}$$

where n is total number of households selected; and

N is total number of households in the population.

The per capita wood consumption and S.E. have been computed by: $\frac{\hat{Y}_{reg}}{X}$ and $\frac{S.E.}{X}$

CHAPTER - IV

1. Analysis and Discussion

1.1 Per Capita Wood Consumption in Rural Sector

The present annual per capita wood consumption has been assessed as under:-

House construction	..	0.037 M ³
Furniture	..	0.002 M ³
Agricultural Implements	..	0.010 M ³
Fuel wood	..	0.506 tonnes

The percentage standard error of various estimates have been worked out and the same are as 9.5%, 16.9%, 6.9% and 4.9% respectively.

1.2 Per Capita Wood Consumption in Urban Sector

The present per capita annual consumption has been computed as:-

House Construction	..	0.013 M ³
Furniture	..	0.004 M ³
Fire wood	..	0.319 tonnes

The standard error of estimates have been assessed as 16.6%, 11.0% and 15.8% respectively.

1.3 Present Annual Consumption of Wood

The total present consumption of wood has been worked out as 1168.15 thousand cu.m which consists of 1100.55 thousand cu.m of firewood and 67.60 thousand cu.m of round wood. Of the total round wood consumption, 51.1 thousand cu.m. is for house construction, 4.2 thousand cu.m for furniture and 12.3 thousand cu.m for making agricultural implements. The details are given in Table-8.

1.4 Forecast of Future Wood Requirement

The future projections in wood consumption has been made on the basis of population growth. The population projections in rural as well as urban sector has been arrived at using the Newton's advancing difference formula. The population of Shimoga district in 1991 will be 14.71 and 6.14 lakh in rural and urban sector respectively and in 2001 it will be about 17.11 and 8.74 lakh respectively. It is estimated that wood requirement in 1991 will be 82.40 thousand cu.m of round wood and 1363.29 thousand cu.m of firewood while in 2001 this will be 98.60 thousand cu.m and 1659.67 thousand cu.m respectively. The details are given in Tables 9 & 11.

1.5 Bamboo requirement

It has been estimated that the present demand for bamboo in household sector is around 8.6 thousand tonnes which is expected to go upto 10.9 thousand tonnes in 1991 and to 12.8 thousand tonnes in 2001 A.D. The bamboo is used mostly in rural areas for various purposes such as roofing, fencing, shed construction, etc.

1.6 Supply Position

The production of wood and bamboo is shown in Table-1 which indicates the round wood production as 53.17, 35.39 and 40.45 thousand cu.m during 1980-81, 1981-82 and 1982-83 respectively and firewood production as 46.65, 46.55 and 38.80 thousand cu.m in three years and bamboo production as 20.28, 45.91 and 18.97 thousand tonnes respectively. Thus

it is observed that the wood production is constantly on the decline. If we take 1980-81 as base then we see that the round wood production has declined by 33.4% and 23.9% during 1981-82 and 1982-83 respectively. The production of firewood has also decreased by 0.2% and 16.8% during 1981-82 and 1982-83. The bamboo production has shown an increase of 126% in 1981-82 and decline of 6.4% in 1982-83. The decline in production is due to less availability of produce in the forest and conservative working of the forest as a consequence of environmental awareness. Wood is supplied to some of the industries such as WIMCO and Harihar Polyfibre outside the district. WIMCO takes matchwood while Harihar Polyfibre takes Eucalyptus wood. It is found that 20.28 thousand cu.m of wood has been supplied to these industries during 1982-83. Wood supply to various industries within the district is mainly to IPM and MPM. The supply to MPM is only bamboo which was 16.93 thousand tonnes during 1982-83 and the balance 2.04 thousand tonnes was used for domestic consumption. The MPM gets its supplies of raw material from various other divisions also.

1.7 Gap between Demand and Supply

It has been noticed that of the total production during 1982-83, the wood available for domestic consumption after supplies to various industries has been 20.17 thousand cu.m as round wood and 38.80 thousand cu.m as firewood and 2.04 thousand tonnes of bamboo. There is a vast gap between demand and supply which is shown in Table-11. The gap is met mostly from supplies which comes from outside the district as the

merchants bring timber purchased in auction sales conducted in various other divisions such as Haliyal, N. Kanara, Belgaum, Chikamagalur, etc. The exact arrival from outside the district is not available. The other sources include the material available from private land and illicit removal from the forest. The Government supply of firewood is mostly restricted to towns and cities and almost absent in villages. It is estimated that additional requirement of round wood and firewood during 1991 will be 62.23 thousand cu.m and 1324.49 thousand cu.m respectively and during 2001, 78.43 thousand cu.m and 1620.87 thousand cu.m respectively while that for bamboo will be 8.86 and 10.76 thousand tonnes respectively.

1.8 Ways to meet the Gap

It is very necessary that steps are taken to meet the vast gap in demand and supply and protect whatever forests are left for ecological needs. The forest department is raising large scale plantations to enable itself to cope up with the future demand. It is expected that additional requirement of wood during 1991 and 2001 will be about 1386.72 and 1699.30 thousand cu.m respectively. If it is presumed that the M.A.I. of the species planted would be at least 5 cu.m/ha then yield at the rotation of 10 years will be 50 cu.m/ha. Hence to meet the demand in 1991 about 2775 ha plantations have to be raised per year and 625 ha of additional plantations have to be raised from 1991 onwards

to meet the demand in 2001. Presuming the cost of raising plantations to be Rs.3,500/- per ha the financial requirement per annum to raise 2775 ha of plantations would be around 97.12 lakh rupees.

Table-1

Total Production of Wood in Shimoga District

Sl. No.	Category	Unit	1980-81	1981-82	1982-83
1.	Round Timber	000 M ³	17.58	18.34	18.36
2.	Poles	000 M ³	14.80	10.95	5.60
3.	Pulpwood + Plywood	000 M ³	29.11	7.53	14.52
4.	Sawn Timber	000 M ³	-	-	1.97
5.	Total	000 M ³	53.17	35.39	40.45
6.	Firewood	000 M ³	46.65	46.55	38.80
7.	Total Wood (5+6)	000 M ³	99.82	81.94	79.25
8.	Total Bamboo	000 tonnes	20.28	45.91	18.97

(Source : D.C.F's Office of Shimoga District)

Table-2

Supply of Wood from Shimoga District during 1982-83 to outside the District

S.No.	Category	Unit	Quantity
1.	Timber	000 M ³	0.75
2.	Pulp wood + Plywood	000 M ³	17.56
3.	Sawn Timber	000 M ³	1.97
4.	Total	000 M ³	20.28

(Source : D.C.F's Office, Shimoga District)

Table-3

Production and Utilization of Wood during 1982-83 in Shimoga District

Sl. No.	Category	Unit	Total production	Supply from the district to outside places	Available for consumption within the district.
1.	Round Timber	000 M ³	18.36	0.75	17.61
2.	Poles	000 M ³	5.60	-	5.60
3.	Pulpwood + Plywood	000 M ³	14.52	17.56	(-) 3.04
4.	Sawn Timber	000 M ³	1.97	1.97	-
5.	Total (1+4)	000 M ³	40.45	20.28	20.17
6.	Firewood	000 M ³	38.80	-	38.80
7.	Total Wood (5+6)	000 M ³	79.25	20.28	58.97
8.	Total Bamboo	000 Tonnes	18.97	-	18.97

Table-4

Wood Available for Consumption within Shimoga District During 1982-83

S.No.	Category	Unit	Plywood	Paper Mill	Others	Total
1.	Round wood	000 M ³	2.73	-	17.44	20.17
2.	Fire wood	000 M ³	-	-	38.80	38.80
3.	Total wood (1+2)	000 M ³	2.73	-	56.24	58.97
4.	Bamboo	000 Tonnes	-	16.93	2.04	18.97

Table-5

Population Statistics of Shimoga District

Unit - Lakh

Census year	Total	Rural Sector	Urban Sector
1961	10.17	7.57	2.60
1971	13.01	9.94	3.07
1981	16.57	12.32	4.25
1991 Projected	20.85	14.71	6.14
2001 Projected	25.85	17.11	8.74

Total Number of Rural Households - 176006

Total Number of Urban Households - 60788

(Source : Shimoga District, 1981-82 - An Economic Review)

Table-6 ✓

Present Per Capita Consumption of Wood
in Shimoga District

S.No.	Category	Unit	Rural Sector		Urban Sector	
			Consumption	SE%	Consumption	SE%
1.	House Construction.	M ³	0.746	9.5	0.268	16.6
2.	Furniture	M ³	0.034	16.9	0.075	11.0
3.	Agricultural Implements	M ³	0.049	6.9	-	-
4.	Fire wood	Tonnes	0.506	4.9	0.319	15.8
Total		M ³	1.563	-	0.806	-

Table-7

Present Per Capita Annual Consumption of Wood
in Shimoga District

S.No.	Category	Unit	Rural Sector	Urban Sector
1.	House Construction	M ³	0.037	0.013
2.	Furniture	M ³	0.002	0.004
3.	Agricultural Implements	M ³	0.010	-
4.	Firewood	Tonne	0.506	0.319
5.	Total	M ³	0.783	0.480

Table-8

Present Annual Consumption of Wood in Shimoga District.

Category	Unit	Rural sector	Urban sector	Total
House Construction	Lakh M ³	0.456	0.055	0.511
Furniture	Lakh M ³	0.025	0.017	0.042
Agricultural Implements	Lakh M ³	0.123	-	0.123
Firewood	Lakh Tonne	6.234	1.356	7.590
Total	Lakh M ³	9.643	2.038	11.681

Table-9
Projected Demand for Wood in Shimoga District.

S.No.	Category	Unit	Rural Sector		Urban Sector		Total	
			1991	2001	1991	2001	1991	2001
1.	House Construction	Lakh M ³	0.544	0.633	0.080	0.114	0.624	0.747
2.	Furniture	"	0.029	0.034	0.024	0.034	0.053	0.068
3.	Agricultural Implements	"	0.147	0.171	-	-	0.147	0.171
4.	Firewood	Lakh Tonnes	7.443	8.658	1.959	2.788	9.402	11.446
Total			11.512	13.392	2.944	4.191	14.456	17.583

Table-10

Present and Future Demand for Bamboo in Shimoga District

Category	Unit	Rural Sector		Urban Sector		Total
		3-6 cm dia	7-9 cm dia	3-6 cm dia	7-9 cm dia	
Annual Per Capita Consumption	Nos.	0.55	0.42	0.19	0.03	-
Total Present Consumption	Lakh Tonne	0.045	0.034	0.005	0.001	0.086
Projected Demand for 1991	"	0.054	0.041	0.008	0.001	0.109
Projected Demand for 2001	"	0.062	0.048	0.011	0.002	0.128

Note:- Length of Bamboo is 6 metres.

Table-11

Gap Between Demand and Supply of Wood and Bamboo in Shimoga District.

Sl. No.	Category	Unit	Present supply	Present demand	Gap	Projected Demand in 1991	Projected Gap in 1991	Projected Demand in 2001	Projected Gap in 2001
1.	Round wood	000 M ³	20.17	67.60	47.43	82.40	62.23	98.60	78.43
2.	Fire wood	"	38.80	1100.55	1061.75	1363.29	1324.49	1659.67	1620.87
3.	Total	"	58.97	1168.15	1109.18	1445.69	1386.72	1758.27	1699.30
4.	Bamboo for domestic use	000 tonne	2.04	8.60	6.56	10.90	8.86	12.80	10.76

FOREST SURVEY OF INDIA
25, SUBHASH ROAD, DEHRADUN

WOOD CONSUMPTION SURVEY
GENERAL INFORMATION (DOMESTIC)

Schedule-A

1. Name of the owner of the house:
2. Total No. of houses in the village:
3. Name of the village/town/city:
4. Name of Tehsil and Forest Range:
5. Name of the District and Forest Divn.:
6. Type of Building actually visited as a sample unit. Katcha/pucca/multi-storeyed.
7. No. of storeys - total and used for living only (to be filled in if more than one storey).
8. Serial No. of the building out of the total building to be visited in the village.
9. Ward No. - House No. in Municipal area and cities wherever available.
10. No. of Households living in the building.
11. Total No. of Persons living in the building.
12. Distance from the house to the nearest forest or jhum kheti area which is under the control of the Forest Department. Actual if it is less than 10 kms.
13. Average Annual Income of the Family - Nature of occupation (service/cultivation/business).
14. Average plinth area occupied by each house - includes verandah covered by roof and floor.
15. 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-I : EXISTING USE OF WOOD IN HOUSEHOLD

Year of Construction:

Item	No.	Size L x W x thickness	Quantity of wood/ Bamboo used in M ³	Source: Forest/ Market
1. Door (Wooden) Door Ply.				
2. Window (Glass) Wooden				
3. Roof wooden with planks & beams (Bamboo)				

What are the important tree/bamboo species mostly used for construction purposes?

Doors & windows include the Frames and Panels.

FORM-II : EXISTING FURNITURE ITEMS

Year of Manufacture:

Item	Numbers	Approximate quantity of sawn wood M ³	Remarks
1. Chairs			
2. Tables			
3. Wooden Almirah			
4. Cots			
5. Others (Specify)			

What are the important tree/bamboo species most used for furniture manufacture?

FORM-III : AGRICULTURAL IMPLEMENTS

Item	No.	Quantity of wood used
1. Plough with Yoke		
2. Bullock Cart		
3. Leveller		
4. Tool Handles (Axes, sythe spal etc.)		
5. Others (Specify)		

FORM-IV : FUEL CONSUMPTION

Item	Unit	Quantity/Day	Quantity per year
1. Wood	Kg.		
2. Agri. waste	Kg.		
3. Charcoal	Kg.		
4. Coal	Kg.		
5. Kerosene	Lts.		

Signature

Name of Surveyor

SAMPLED VILLAGES FOR DATA COLLECTION IN RURAL SECTOR

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	2	3	4	5	6
1.	Sakrabyale	592	90	5	31
2.	Lakkinkoppa	577	70	5	25
3.	Hosakoppa	48	15	5	34
4.	Yadavatti	143	35	5	38
5.	Yarakoppa	186	25	5	32
6.	Bilguni	319	50	5	44
7.	Kenchipoppa	1966	250	5	59
8.	Katinahole	376	72	5	22
9.	Kythanakoppa	240	80	7	50
10.	Sommammallapura	566	86	5	66
11.	Suntikoppa	2987	321	5	45
12.	Alavalli	656	140	7	40
13.	Siddapura	791	136	5	51
14.	Garga	263	52	5	20
15.	Kolangi	439	72	7	70
16.	Kanagalkoppa	35	5	4	33
17.	Tarige	356	52	6	57
18.	Balagodu	186	30	5	22
19.	Guthanahalli	213	38	7	57
20.	Gauthampura	1306	250	5	55
21.	Ramagondankoppa	134	26	6	41
22.	Gangavalli	358	60	5	39

Contd...

1	2	3	4	5	6
23.	Sigga	1187	240	5	70
24.	Nimbegondi	1126	225	5	27
25.	Chilapura	409	75	5	52
26.	Kodikoppa	197	35	6	48
27.	Barangi	1228	250	6	46
28.	Amtekoppa	906	150	6	56
29.	Muthagi	445	70	5	43
30.	Doddabhigera	1754	280	7	43
31.	Hirenda	1186	172	5	46
32.	Chikkagopena halli	784	140	5	35
33.	Taverekere	2084	400	9	62
34.	Aralihalli	2945	431	9	61
35.	Jaloathal	1110	230	6	61
36.	Marsettihalli	1402	200	8	80
Total		129500	4853	206	1661

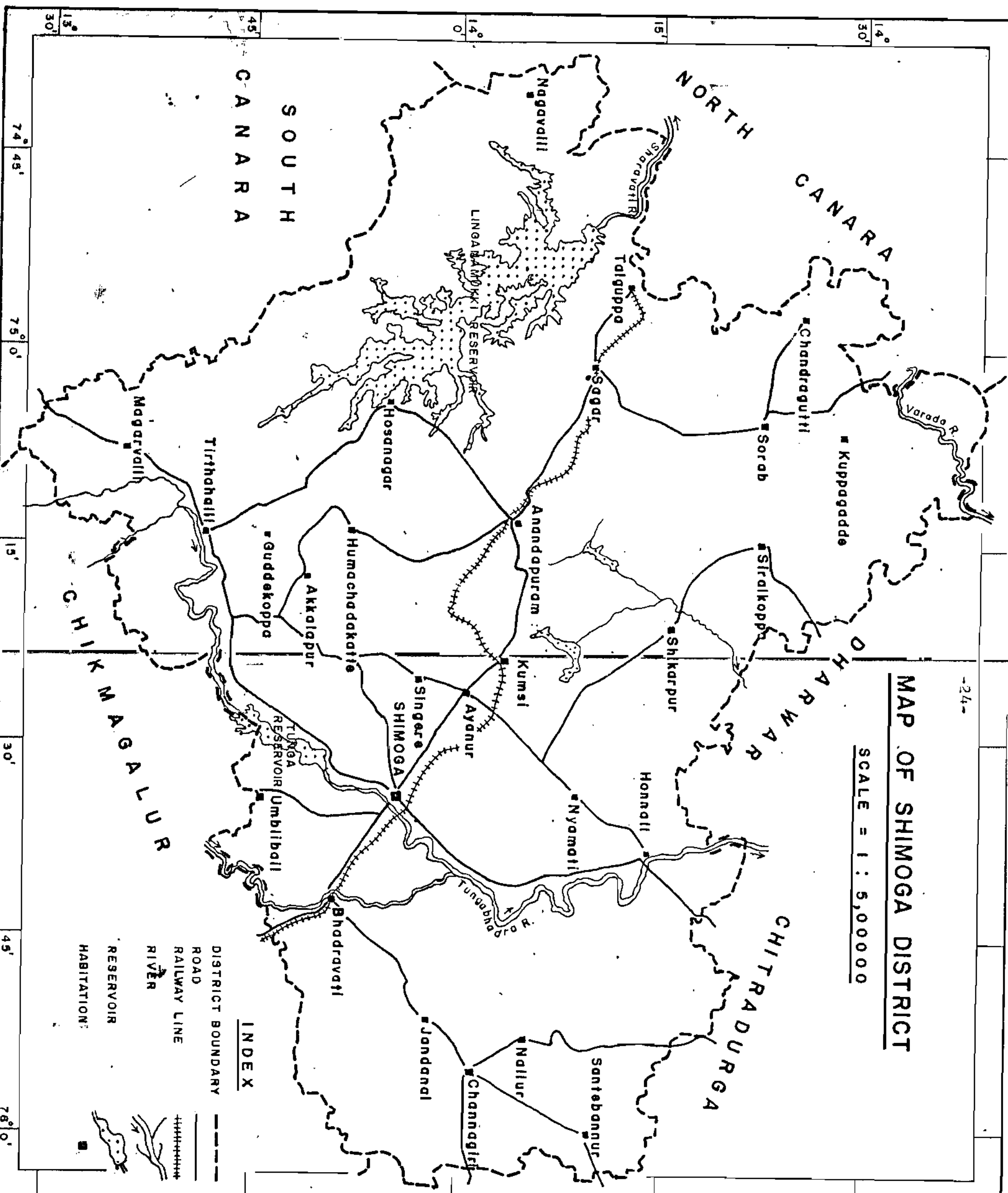
APPENDIX 'C'

STATEMENT OF HOUSEHOLDS SELECTED FOR DATA COLLECTION IN URBAN SECTOR

Sl. No.	Name of the Town	Total population	Total No. of households	No. of households sampled	Total population of sampled households
1.	Bhadravathi	130,606	16,325	23	178
2.	Shimoga	156,746	25,951	24	145
	Total	287,352	42,276	47	323

MAP OF SHIMOGA DISTRICT

SCALE = 1 : 5,00,000



INDEX

- DISTRICT BOUNDARY
- ROAD
- RAILWAY LINE
- RIVER
- RESERVOIR
- HABITATIONS