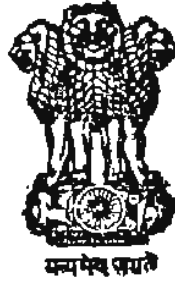




GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT AND FORESTS
(DEPARTMENT OF ENVIRONMENT, FORESTS & WILD LIFE)

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

FOREST SURVEY OF INDIA
SOUTHERN ZONE
BANGALORE
DECEMBER 1988



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P R E F A C E

The Wood Consumption Survey is a necessary ingredient in a wood balance study. 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 supply with demand.

This special study of the wood consumption survey in Hassan District of Karnataka was carried out in 1986-87 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 42106 M³, 26874 tonnes and 475118 M³ respectively. Besides, 23625 M³ of timber, 47743 M³ of firewood and 30 tonnes of bamboos were exported from the district. The total recorded production of timber, bamboo and fuelwood in the district is 49847 M³, 30 tonnes and 71117 M³ respectively. The combined figures of local consumption and export from the district in respect of timber, fuelwood and bamboos are more than the 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 at the Southern Zone of Forest Survey of India. Shri Vedant and his staff are commended for their work.

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

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

(i)

S u m m a r y

A Wood Consumption Survey was conducted in Hassan District to collect wood and bamboo 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. 503 households from 52 villages in the rural sector and 100 households from 5 towns in the urban sector were selected for sampling. An intensity of 1.8% was achieved in the survey. The results of the survey are summarized below:-

(i) The per capita 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	0.381	5.8	0.320	8.7	0.371	5.1
2.	Furniture	"	0.013	14.3	0.054	19.5	0.020	12.1
3.	Agricultural implements	"	0.045	7.4	0.005	42.2	0.039	7.4
4.	Bamboo	kg	44	10.2	-	-	36.559	10.3

(ii) The per capita annual fuelwood consumption in the district is -

Rural (m ³)		Urban (m ³)		Overall (m ³)	
Per capita	SE%	Per capita	SE%	Per capita	SE%
0.297	11.2	0.416	13.9	0.317	9.3

(ii)

(iii) The present annual consumption of wood and bamboo in the district, keeping 1981 as the base year, is -

Sl. No.	Item	Unit of measurement	Present annual consumption
1.	House construction	'000 m ³	26.836
2.	Furniture	'000 m ³	0.759
3.	Agricultural implements	'000 m ³	14.511
4.	Fuelwood	'000 m ³	475.118
5.	Bamboos	'000 tonnes	26.874

(iv) The net availability of fuelwood in the district out of the recorded production of firewood is only 20,920 cu.m. Therefore the estimated unrecorded production of fuelwood in the district is 4,54,198 cu.m. Since the total extent of the forest areas in the district is only 8% of the geographical area of the district, not more than 20% of 4,54,198 cu.m. of the total unrecorded production of fuelwood comes from the forests i.e. about 90,839.6 cu.m. This represents a uniform loss of 2.6 cu.m. of the growing stock in the forests of the district, per hectare per year.

CHAPTER - I
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 Hassan 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 in Hassan district are enumerated below:

- 2.1 To study the trend of production of wood (timber, poles, firewood and charcoal) and bamboos within the survey zone.
- 2.2 To assess the demand and consumption of wood and bamboos by the rural and urban households and wood based industries.
- 2.3 To work out present and future wood and bamboo consumption scenarios.

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)-3231 dated 16.4.86) 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

2.0 General Description of the Survey Area

Hassan district lies between $12^{\circ} 30'$ and $13^{\circ} 37'$ North latitudes and $75^{\circ} 30'$ and $76^{\circ} 37'$ East longitudes. A very limited part of the district (Sakhleshpur taluk) comes under the Western Ghats. The total area of the district is $6,823 \text{ km}^2$.

2.1 Population

The district has a population of 13,57,014 (1981 census) forming a density of 199 persons per km^2 . The rural and urban populations of the district are 11,58,542 (85%) and 1,98,472 (15%) respectively. The decennial population growth rate in the district is 23.10%.

2.2 Forests

The total extent of the forests in the district as planimetered from the Survey of India toposheet (1:50,000) is 598.74 km^2 , constituting about 8.8% of the geographical area. The legal status wise break up is given below:

Reserved Forest	:	381.61 km^2
Protected forest	:	Nil
Unclassed forest	:	217.13 km^2
		<u>598.74 km^2</u>

Out of 598.74 km^2 the extent of area actually under tree vegetation is 338.368 km^2 . The average standing volume per hectare in these forests is about 56 cu.m. Thus the total

standing growing stock in the forest of the district may be about 18,94,816 m³ ± 5.5%. 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 1984-85.

The forests in the Western Ghat region range from evergreen and semi-evergreen in the montane region to moist deciduous and dry deciduous in the submontane region. The forests are mostly of the dry deciduous and the scrub types in the maidan areas of the district.

2.3 Market Centres

Sakleshpur and Hassan are the two most important market centres for trade in timber. Due to the severe restrictions imposed on the extraction of timber from Government forests, due to a heightened awareness of the consequences of disforestation, the inventories of timber stock in the Government Timber depots in these two places has steadily been diminishing. The private timber trade however continues with increased dependence on timber and fuelwood extracted from the coffee estates and other lands.

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.	0.381	5.8	0.320	8.7	0.371	5.1
Furniture	cu.m.	0.013	14.3	0.054	19.5	0.020	12.1
Agricultural implements	cu.m.	0.045	7.4	0.005	42.2	0.039	7.4
Bamboos	kg	44	10.2	-	-	36.559	10.3

The following tables 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	0.297	11.2	0.416	13.9	0.317	9.3

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

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

where P_o 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	31,507	House construction	'000 m ³	26.836
		Furniture	'000 m ³	0.759
		Agricultural implements	'000 m ³	14.511
		Bamboos	'000 tonnes	26.874

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.)
14,98,796	475.118

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 2 strata depending on the distance of the villages from the nearest forest; 0 to 5 km, and 5 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

Average Consumption of Wood for Different Uses

Item of consumption	Unit	Stratum A 0 to 5 km		Stratum B 5 km & beyond	
		Per capita	SE%	Per capita	SE%
House construction	m ³	0.369	8.81	0.394	7.47
Furniture	"	0.014	23.29	0.012	12.50
Agricultural implements	"	0.035	7.09	0.056	11.54
Fuelwood	"	0.416	13.94	0.164	15.46
Bamboos	tonnes	0.042	13.97	0.044	15.23

Except in respect of fuelwood consumed the above results show no significant difference between the consumption of wood for house building, furniture and agricultural implements in the two strata. The quantity of fuelwood consumed in Stratum B is significantly lower than in A. The essential difference seen in the Chickamagalur and Hassan district wood consumption surveys is that while in Chickamagalur four strata (0 to 3 km, 3 to 6 km, 6 to 9 km, 9 km and beyond) were recognised, in Hassan only two strata (0 to 5 km & 5 km and above) have been recognised.

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

Wood and Bamboo Production Statistics at a glance

Particulars of wood	Unit of measurement	1984-85	1985-86
Timber	'000 m ³	82.687	49.847
Firewood	"	109.160	71.117
Charcoal	'000 tonnes	0.056	-
Bamboos	"	0.033	0.030

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	1984-85	1985-86
Timber	'000 m ³	41.031	23.625
Firewood	"	90.695	47.743
Charcoal	'000 tonnes	0.056	-
Bamboo	"	0.033	0.030

3.4 Unrecorded Production of Wood

Net availability of wood and bamboo for consumption within the district is worked out by subtracting the net wood and bamboo exports out of the district from the overall production figures. This is shown in table 3.4.1.

Table 3.4.1

Net Availability of Wood and Bamboo for Internal Consumption

Particulars of wood	Unit of measurement	1984-85	1985-86
Timber	'000 m ³	41.656	26.222
Firewood	"	18.465	23.374
Charcoal	'000 tonnes	-	-
Bamboo	"	-	-

It is seen that the district is generally self-sufficient as far as timber is concerned. However against the estimated requirement of 4,75,118 cu.m. of firewood and 26,874 tonnes of bamboos the net availability amounts to a negligible 20,920 cu.m. per annum of firewood and no bamboo. Thus it is clear that 4,54,198 cu.m. is the net annual unrecorded production of firewood and 26,874 tonnes of bamboos. This represents a loss of a high 13.4 cu.m./ha./year of the growing stock of wood from the forests. However it would be unreasonable to expect the entire quantity of the unrecorded production of fuelwood to come from the very limited extent of forests in this district. It would be more accurate to assume that only 20% of the unrecorded production comes from the forests of the district, the balance coming from private and other non-forest waste lands. This would still mean a loss of 2.7 to 3 cu.m./ha./year of the forest growing stock to meet the fuelwood demands of the people.

A P P E N D I C E S

Sampled Villages for Data Collection in Rural SectorSTRATUM 'A'

Sl. No.	Name of the village	Village population (1981)	Total No. of households in the village	Total No. of households selected	Population of households selected
1	2	3	4	5	6
1.	Arakere	1,733	327	10	78
2.	Nanjanayakana-koppalu	-	-	10	104
3.	Rayapura	495	77	10	70
4.	Shankha	971	163	10	90
5.	Kondajjikoppalu	-	-	10	74
6.	Mallanayakana-halli	139	25	10	52
7.	Anuganahalli	-	-	10	83
8.	Upparahosahalli	241	49	10	55
9.	Irupanahalli	-	-	9	40
10.	Allappatna	416	72	10	61
11.	Hirehalli	-	-	10	82
12.	Kattepura	1,442	229	10	84
13.	Kuppe	-	-	10	72
14.	Mulehosahalli	-	-	10	56
15.	Siddapura	971	160	10	66
16.	Virajapura	-	-	10	56
17.	Adagurcholena-halli	-	-	10	51
18.	Somlapura	245	35	10	81
19.	Devalpura	184	32	10	74
20.	Hodachhalli	-	-	4	17

Contd..

1	2	3	4	5	6
21.	Makkilipala	-	-	6	42
22.	Vaddahalli	-	-	9	50
23.	Patla	-	-	10	55
24.	Halsur	-	-	5	24
25.	Kamanahalli	87	10	12	66
26.	Gollarahatti	-	-	10	64
27.	Gollarahatti	-	-	10	70
28.	Marenhalli	318	56	10	86

Sampled Villages for Data Collection in Rural Sector

STRATUM 'B'

Sl. No.	Name of the village	Village population (1981)	Total No. of house-holds in the village	Total No. of house-holds selected	Population of house-holds selected
1.	Basvanapura	130	22	10	67
2.	Chikkakondagula	-	-	10	84
3.	Hosarajagere	-	-	10	60
4.	Karavangala	-	-	10	55
5.	Kuppalli	-	-	10	69
6.	Bommasamudra	647	125	10	66
7.	Arasi halli	430	68	10	82
8.	Gundakallana-halli	-	-	10	64
9.	Govinakere	600	94	10	74
10.	Kadayyanakoppalu	-	-	10	66
11.	Hullenahalli	535	96	10	96
12.	Gaurikoppalu	-	-	10	70
13.	Governahalli	-	-	10	56
14.	Ganganahalli	-	-	10	73
15.	Settigarahalli-koppalu	-	-	10	84
16.	Hosur	-	-	10	57
17.	Kayalnahalli-koppalu	-	-	10	48
18.	Hulmatighatta	422	74	9	89
19.	Nallur	813	139	10	75
20.	Tatanahalli	1,576	277	10	65
21.	Machubunahalli	-	-	10	85
22.	Makanahalli	572	103	7	45
23.	Hunse	422	67	10	83
24.	Kesagodu	-	-	10	65

Sampled Villages for Data Collection in Urban Sector

Towns

Sl. No.	Name of the town	Town population (1981)	Total No. of households in the town	Total No. of households selected	Population of households selected
1.	Arsikere	25,351	4,108	20	159
2.	Belur	13,590	2,416	20	250
3.	Hassan	71,534	12,580	20	158
4.	Konnanuru	6,931	1,228	20	98
5.	Sarvanbelgola	5,441	872	20	128
	Total	1,22,847	21,204	100	793

Appendix-IV

Population Statistics of Hassan District

Census year	Total population	Rural Sector	Urban Sector
1961	8,95,847	7,88,311	1,07,536
1971	11,02,370	9,52,959	1,49,411
1981	13,57,014	11,58,542	1,98,472
1991 Projected	16,72,089	14,08,439	2,63,650
2001 Projected	20,62,472	17,12,239	3,50,233

Appendix-V

Present Per Capita Annual Requirement of Wood in Hassan District

Sl. No.	Category	Stratum A		Stratum B		Rural		Urban		Overall	
		Per capita	SE%	Per capita	SE%	Per capita	SE%	Per capita	SE%	Per capita	SE%
1	2	3	4	5	6	7	8	9	10	11	12
1.	House construction	0.369	8.8	0.394	7.5	0.381	5.8	0.320	8.7	0.371	5.1
2.	Furniture	0.014	23.3	0.012	12.5	0.013	14.3	0.054	19.5	0.020	12.1
3.	Agricultural implements	0.035	7.1	0.056	11.5	0.045	7.4	0.005	42.2	0.039	7.4
4.	Bamboo (tonnes)	0.042	14.0	0.044	15.2	0.044	10.2	-	-	0.037	10.3

Present Per Capita Annual Fuelwood Consumption in Hassan District

1	2	3	4	5	6	7	8	9	10	11	12
1.	Firewood	0.416	13.9	0.164	15.5	0.297	11.2	0.416	13.9	0.317	9.3

Appendix-VI

Production and Utilization of Wood in Hassan District

Sl. No.	Category	Unit	1984-85		1985-86			
			Total production	Supply from the district to outside	Available for consumption within district.	Total production	Supply from the district to outside	Available for consumption within district
1.	Round Timber	'000 m ³	82.687	41.031	41.656	49.847	23.625	26.222
2.	Firewood	'000 m ³	109.160	90.695	18.465	71.117	47.743	23.374
3.	Charcoal	'000 tonnes	0.056	0.056	-	-	-	-
4.	Bamboo	'000 tonnes	0.033	0.033	-	0.030	0.030	-

Appendix-VII

Wood Available for Industrial Consumption from Hassan District

Category	Unit	1983-84				1984-85				1985-86			
		Ply-wood	Pulp wood	Others	Total	Ply-wood	Pulp wood	Others	Total	Ply-wood	Pulp wood	Others	Total
Timber	'000 m ³	3.027	7.877	0.412	11.316	1.996	3.626	0.313	5.935	2.499	11.283	-	13.782
Firewood	'000 m ³	-	-	2.800	2.800	-	-	0.760	0.760	-	-	1.220	1.220
Total	'000 m ³	3.027	7.877	3.212	14.116	1.996	3.626	1.073	6.695	2.499	11.283	1.220	15.002

FOREST MAP OF HASSAN DISTRICT

SCALE 1:500000

36

15'

13
0'

12
45'

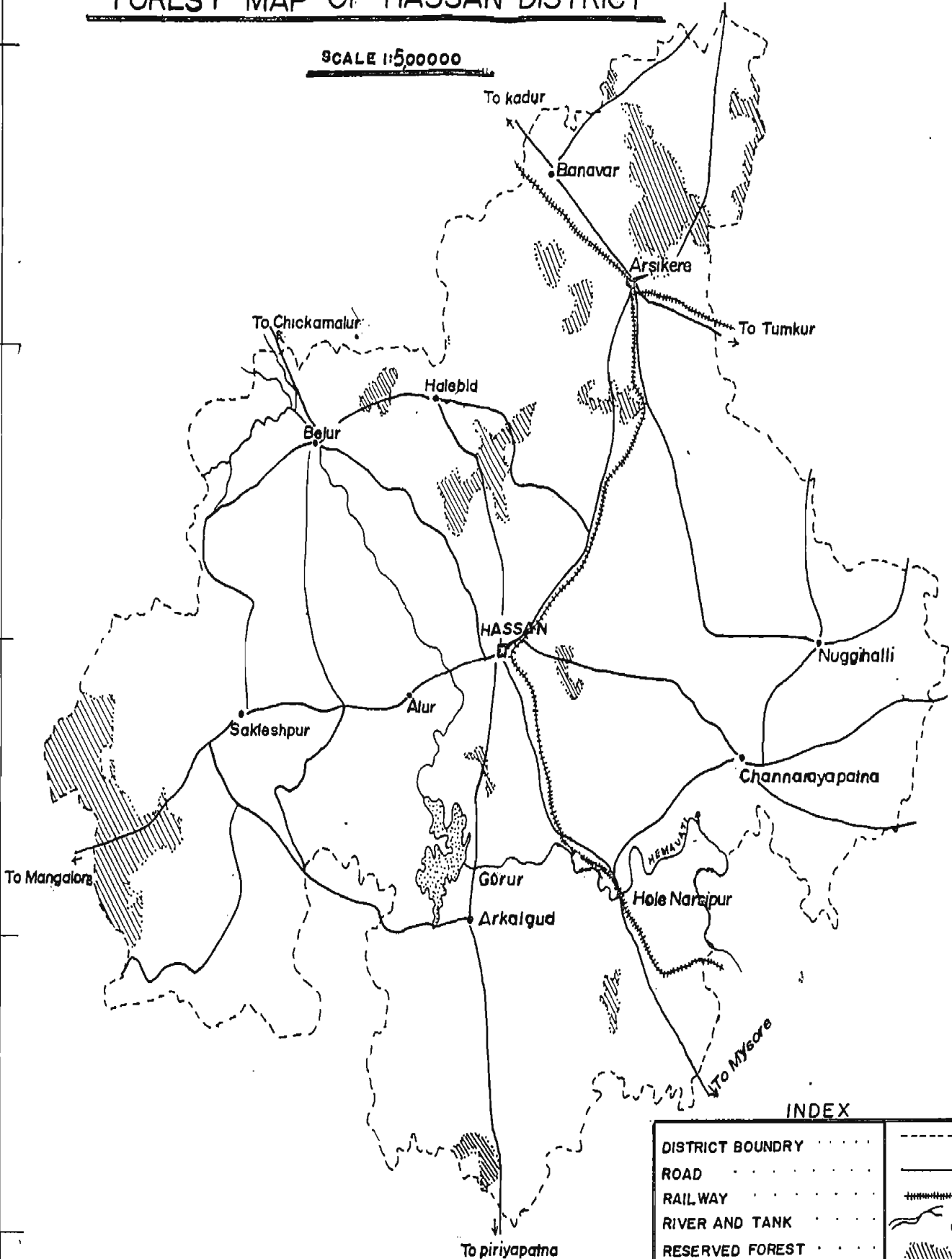
12
36'

75 45'

76 10'

15'

36'



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