



GOVERNMENT OF INDIA
MINISTRY
OF
ENVIRONMENT AND FORESTS

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A
REPORT
ON
INVENTORY OF NON-FOREST AREA
IN
NARSIMHAPUR DISTRICT
(MADHYA PRADESH)



FOREST SURVEY OF INDIA
CENTRAL ZONE
NAGPUR
2003

DD/CPJ
TR
16-2

10/12



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PREFACE

The growing stock of trees existing in non-forest area plays a very important role in meeting the requirement of local people for timber and fuelwood. To estimate this growing stock the Forest Survey of India, for the first time, took up inventory of non-forest areas in 1991. During the year of 1992, the Central Zone Unit of Forest Survey of India, having its Headquarter at Nagpur, conducted a pilot survey in Madhya Pradesh State (Geographical area 443446 sq. km.). Nineteen representative villages, covering all the 12 agro-climatic zones, in the entire non-forest area (288032 sq. km.) were selected and number of trees in these villages was counted and sample size was worked out for the regular survey to be undertaken in non-forest area of the State. Accordingly, 199 sample villages were considered to be taken up for sampling of non-forest area of the State. Further, the number of sample villages for non-forest inventory in each district, was calculated based on its geographical area.

Thus, only 2 sample villages were to be surveyed in Narsimhapur district having geographical area 5133 sq. km. However, in order to get proper representation in sampling of this district, 4 sample villages were randomly selected representing all sub-divisions from where data on various field forms were collected.

Result of the survey indicates that Narsimhapur district having 3750 sq. km. of non-forest area, has 1146824 trees of different species and diameter classes with corresponding volume of 990087 cu. m. This is, no doubt, a substantial quantity of wood to meet the requirement of timber and fuelwood of the local people.

The efforts made in field survey and bringing out this report by the concerned officials are appreciated. I trust, this report gives ample details about the tree vegetation existing in non forest area of Narsimhapur district which will be quite useful to the user agencies and the planners as well.

Forest Survey of India
DEHRADUN

Dr. J. K. Rawat
Director,

ACKNOWLEDGEMENTS

On behalf of the Forest Survey of India, Central Zone, Nagpur, I express a deep sense of gratitude and sincere thanks to the office bearers of all the village panchayats as well as to the villagers of Narsimhapur district for extending every possible help, co-operation and hospitality to the field staff of this organization and making their stay comfortable without which the field inventory could not have been completed within the stipulated time.

I am also thankful to the Collector, Narsimhapur and the other revenue officials for providing useful information required for the inventory of trees outside forest areas of the district. Thanks are also due to the Conservator of Forests, Seoni Circle, the Divisional Forest Officer, Narsimhapur Forest Division and the field staff that provided the much needed help and co-operation to the field parties of this Organization, without which it would not have been possible to complete this survey.

Forest Survey of India
Central Zone, Nagpur.

Dr. Tejinder Singh,
Regional Director

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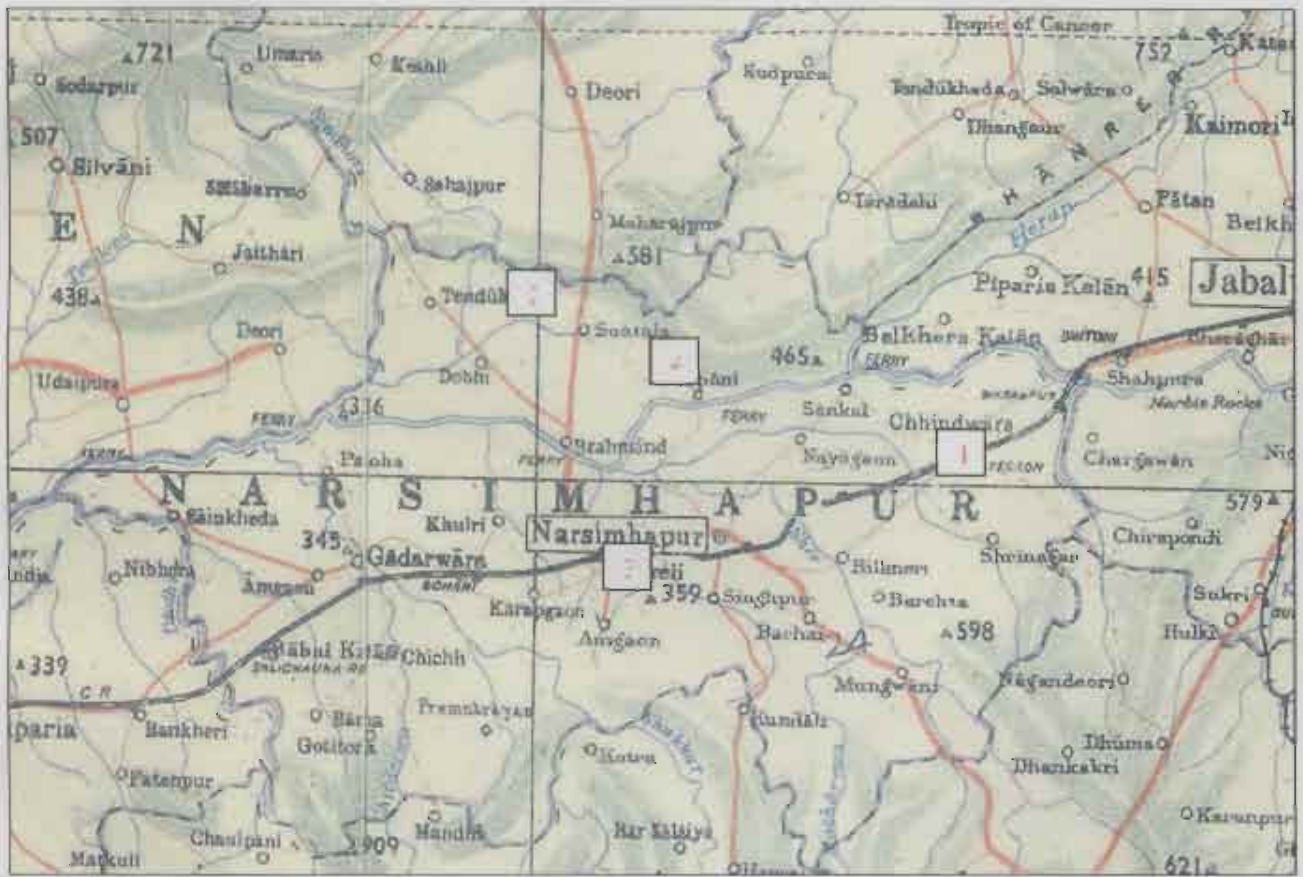
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**MAP SHOWING LOCATION OF SELECTED VILLAGES FOR
INVENTORY OF NON-FOREST AREA IN NARSIMHAPUR DISTRICT**



LEGEND: 1. Dighori 2. Hathini 3. Maresar 4. Umeria

 **District boundary**

CHAPTER – I

GENERAL

1.1 INTRODUCTION:

The **Pre-Investment Survey of Forest Resources (PISFR)** was created in 1965 as a joint project of Food & Agriculture Organization (FAO) of United Nations Development Programme (UNDP) and Government of India (GOI) to collect forest data and present it on scientific lines for forestry planning. The joint project ended in 1968 and PISFR started functioning as a GOI organization. In 1976, the National Commission on Agriculture converted the Pre-Investment Survey of Forest Resources into National Forest Resources Survey Organization to carryout country-wide comprehensive forest resources surveys at regular intervals and present the information in suitable form for the use of planning organizations at the national, the state and the local levels. The National Forest Resources Survey Organization was re-christened as **Forest Survey of India (FSI)** with effect from 1st June 1981, with its headquarters at Dehradun and four zonal offices, namely, Northern Zone at Shimla, Central Zone at Nagpur, Eastern Zone at Kolkata and Southern Zone at Bangalore. The main activities of Forest Survey of India, include the following:

- * To prepare Forest Cover/Vegetation Maps of the country on 1:2,50,000 scale and comprehensive biennial “**State of Forest Report**” (SFR) including **National Vegetation Map (NVM)**.
- * To prepare **Thematic Maps (TM)** on 1:50,000 scale depicting forest types and density classes by visual interpretation of aerial photographs procured from the Survey of India.
- * To carry out **Inventory of Forest Resources** in conventional forest areas of selected States/Union Territories.
- * To carry out **inventory of trees outside conventional forest areas** (non - forest areas) in villages/towns/cities of selected districts falling in different physio-graphic zones across the country.
- * To **design methodologies relating to forest surveys** and subsequent updating.

- * To conduct **Wood Consumption Studies** in villages/towns/cities of selected districts of States/Union Territories.
- * To **impart training in modern forest survey techniques** to forestry personnel working at various levels in the Forest Departments of the States/Union Territories.
- * To **support and oversee techniques/inventory work** undertaken by the Forest Departments of States/Union Territories.

The inventory of tree species growing outside conventional forest areas in the country was first carried out by the Forest Survey of India in 1991-92, with the objective to assess the extent of growing stock in the non-forest areas. The rural populace in India has been planting tree species in their homestead, agricultural lands, waste lands, community lands as well as along the road sides, canal banks, sides of railway lines etc. to meet immediate requirements of small timber, agricultural implements, fuel, fodder, etc. The inventory of tree species in non-forest areas of Narasimhapur district was undertaken by Central Zone of FSI, during 1994-95, to make an assessment of the growing stock on revenue lands, i.e. the areas other than the Reserved Forests, the Protected Forests and various categories of Un-classed Forests in the vicinity of villages, along with the inventory of forest resources of the district.

1.2 LOCATION:

Narasimhapur district falls in the region of Middle Narmada Valley and is spread over an area 5133 sq. km. The district has 1383 sq. km. of forest area mainly confined to hill ranges of the Vindhya and the Satpuras forming northern and the southern boundaries. Narmada basin, though fertile, does not support forests of any significance. The non-forest area of the district works out to 3750 sq. km. where survey was conducted and growing stock estimated. The survey was confined only to non forest areas (rural) of the district that lies between 22° 45' and 23° 15' North latitudes and 78° 38' and 79° 38' East longitudes. It is bounded by Damoh, Sagar and Jabalpur districts in the north and Chhindwara district in the south. Seoni district shares the boundary in the east while, Hoshangabad and Raisen districts of the State share the western boundary of the district.

1.3 TOPOGRAPY:

The forests of the district are mainly confined to the hill ranges of the Vindhyas and the Satpuras forming northern and southern boundaries respectively. The fertile Narmada basin extends from south-west to north-west along the river Narmada, where it constitutes major part of non-forest area having sizeable habitation. The Vindhya range comprise extensive flat plateau, abruptly ending in irregular slopes and spurs. In contrast, the Satpuras consist of irregular hills and valleys in the south with steep precipitous slopes. The elevations of plains vary from 1750 to 2000 m. above Mean Sea Level (MSL). The Narmada with its tributaries viz. the Sher, the Shakkar, the Saner, the Barurewa, the Hiran and the Sindhor forms the main sources of drainage system in the district.

1.4 CLIMATE:

The climate of the district is hot and damp to dry. There are four distinct seasons. viz. (i) Summer season from March to June till the monsoon breaks, (ii) Rainy season from June to September, (iii) Post rainy season from September to October and (iv) Winter season from November to February. The maximum temperature varies between 35° C to 45° C in summer while, the minimum temperature varies between 5.5° C to 9° C in winter season. May is the hottest month and December-January are the coolest ones. The annual mean rainfall of the district is 1240 mm. Most of the rains are received between June to September. Sixty two percent of the rainfall is received in July and August alone. Rainy season is equable, post rain is warm, winter season is moderate and pleasant while hot season is severe and awful.

1.5 AREA AND POPULATION:

The total geographical area of the district is 5133 sq. km. whereas its non-forest area extends to 3750 sq. km. As per provisional figures of 2001 census, the district has a population of 957399, out of which 84% is rural and 16% only inhabit urban areas. The decadal growth rate of population is 21.88. The district has a population density of 187 persons per sq. km. Literacy rate is 78.34%. The sex ratio is 909 females for every 1000 males. The Scheduled Caste and Scheduled Tribes population comprises about 29.48% of the total population.

1.6 LIVESTOCK POPULATION:

The livestock population of the district of 1996 census was obtained from the Zilha Sankyiki Pusthika and an abstract is given below (Table No. 1.1):

Table 1.1: LIVESTOCK POPULATION OF NARASIMHAPUR DISTRICT

S. No.	Livestock	Population (Nos.)
1.	Cows	349322
2.	Buffaloes	88080
3.	Sheep/Goats	66599
4.	Others	446974
	Total	950975

1.7 SOCIO-ECONOMIC SCENARIO:

Agriculture and forest play a major role in rural economy. The conventional agriculture is in vogue on small holdings as majority of population i.e. 86% survives on rural economy. The literacy rate is comparatively low, indicating dependency of majority of the population on agriculture. In all, about 40% of the population of the district are the workers who are engaged in different vocations such as agriculture, forestry and industries. There is no major industry, however, there are sizeable SSI units in the district.

1.8 LAND USE PATTERN:

Out of 5133 sq. km. geographical area, forest occupies 1383 sq. km. leaving 3750 sq. km. as non-forest area where survey was conducted. Out of 3750 sq. km. of non-forest area, only 2965.20 sq. km. is put to agricultural use while remaining 784.80 sq. km. land is being used for other purposes.

1.9 AGRO-CLIMATIC ZONE:

There are twelve agro-climatic zones in Madhya Pradesh, out of which Narsimhapur falls under the agro-ecological zone viz. "Middle Narmada Valley".

1.10 IMPORTANCE OF VILLAGE FORESTS:

The trees occurring in village forest produce mainly timber, fuel, fodder, flower/fruit and other minor produces. The trees also provide shade. Timber is obtained mainly from Teak and other commercial species. The other species such as siris, sissoo and shivan etc. are also used for timber work while species like babul, khair, tendu, eucalyptus, jamun and arjun are used as fuelwood. Mangoes, mahua being fruit/flower producing trees, are generally not exploited for timber. Thus, the village forests meet many social requirements of the villagers, thereby bring down their dependency on the Government forests

1.11 ADMINISTRATIVE UNITS:

The district is divided into 5 tehsils and 6 Development Blocks for development purposes. There are 5 towns in the district, the four being tehsil Headquarters and the fifth one is Botaichichli. Tendukheda though given tehsil status recently, has not been considered as town. There are 1081 villages in the district, out of which 1040 are inhabited and 41 are uninhabited villages. Latest (2001) details obtained from Superintendent, Land records, District Collectorate are given below (Table No. 1.2):

Table 1.2: THE TEHSILS & VILLAGES OF NARSIMHAPUR DISTRICT

S. No.	Tahsil	Geographical area	No. of villages	No. of households	Population (2001)
1	Narsimhapur	1193	205	7598	192030
2	Kareli	655	149	3413	138370
3	Gotegaon	924	250	3594	173985
4	Godarwara	1907	356	5044	368315
5	Tendukheda	454	121	NA	84699
	Total	5133	1081	-	957399

CHAPTER - II

DESIGN AND METHODOLOGY

2.1 DESIGN:

There were 45 districts in the un-divided Madhya Pradesh State (divided to create new State of Chhattisgarh during the year 2000) comprising of 12 agro-climatic zones. Then the forest and non forest area of the State were: 155414 sq. km. and 288032 sq. km. respectively. In order to decide the sample size i.e. no. of sample villages to be taken up for non-forest inventory, a pilot survey was conducted in the State by taking 19 villages representing each of the agro-climatic zones. The total inhabited villages in the State were 76468 as per 1991 Census. On the basis of this pilot survey, 199 sample villages were determined for the sample survey and distributed amongst various districts of the undivided Madhya Pradesh according to their geographical areas. Thus, four sample villages were to be taken up for non-forest survey in Narsimhapur district.

2.2 SELECTION OF SAMPLE VILLAGES:

As mentioned above, only four sample villages were selected for non-forest inventory in Narsimhapur district. All the villages of the district were listed after consulting relevant Survey of India toposheets and four sample villages were selected using random number table. The details of sample villages selected are given below (Table No. 2.1):

Table 2.1: SAMPLE VILLEGES SELECTED FOR NFI IN NARSIMHAPUR DISTRICT.

S. No.	Sample village	S. No. of village	Area (Ha.)	Toposheet No.
1.	Dighori	266	734.427	55 M/8
2.	Hathini	31	243.002	55 I/16
3.	Maresar	332	1012.293	55N/I
4.	Umeria	256	231.807	55 M/4
	Total	-	2221.529	-

2.3 DEFINITION OF NON-FOREST AREA:

For the purpose of this survey, all those areas which are outside the forestlands and shown as green wash or by indicating RF, PF, un-classed forest boundaries on toposheets have been considered as non-forests. Mostly revenue-lands, whether they are under private occupation or village panchayat or a community land have been taken up for this survey.

2.4 METHODOLOGY:

The selected sample villages were allotted to four crews, each consisting of one JTA, one Dy. Ranger, two Fieldmen, one Khalasi and two local unskilled mazdoors to assist the crew. The sample villages were marked on toposheets and provided to the crews to facilitate the approach and location by the shortest and convenient route. On reaching sample village, to identify the boundary of village, they took help of the local people as also that of the revenue maps provided by the Revenue Department. The sampling unit was the village. To begin with the data collection, it was necessary to select a starting/reference point preferably some important permanent feature like well/temple/school etc. (need not necessarily be a geometric center of the village). The reference point was described in the Village Description Form. This is important to facilitate cross checking of work by the check crew or a supervising officer. After fixing the reference point, the enumeration work started from reference point by dividing the entire village into suitable sized wedges with the help of a compass in such a manner that enumeration within each wedge could be completed easily without missing any tree or bamboo clump. The enumeration of all trees having breast height diameter 10 cm and above and all bamboo clumps was carried out and recorded in the enumeration forms beginning from north direction proceeding clockwise. This procedure is important to avoid duplication/omission of any trees/bamboo clumps. Further, all enumerated trees/bamboo clumps were marked with chalk stick to ensure no omission/duplication.

2.5 THE FIELD FORMS:

The data were collected in the field Forms described in the succeeding page (Sample Forms are annexed to this report.):

(1) Form No. 1:

The profile of the village obtained from revenue officials is recorded in this Form

(2) Village Description Form:

The information regarding the location of village, description of reference point, various measurements taken by the field staff, date of survey and an abstract of enumeration by wedges is collected in this Form.

(3) District Tree Form:

This Form is filled in for each sample village. The information such as State, District, total number of Villages in the district, number of Sample Villages in the district, area of sample village, category of village is collected together with the abstract of enumeration by various categories.

(4) Village Tree Enumeration Form:

All the trees having diameter at breast height 10 cm. and above occurring in non-forest areas of the sample villages were enumerated in this Form.

(5) Village sample Bamboo Enumeration and Clump Analysis Form:

The enumerated clumps bearing Sr. No. 1, 9, 17, 25..... (1st clump and every 8th clump thereafter) of each bamboo species occurring in sample village were analyzed in detail and recorded in this Form.

(6) Village Bamboo Weight Form:

The length and weight of two green representative bamboos for each species were recorded in this Form.

2.6 CATEGORY OF TREES:

While carrying out the survey, the trees were enumerated by their category and same was indicated against each enumerated tree in the Form. For this purpose, categories of trees given on the succeeding page were identified:

- (1) Farm Forestry: Trees along the farm bunds and in small patches up to 0.1 ha. in area.
- (2) Roadside plantations: Trees planted along road side.
- (3) Village woodlots: Naturally growing trees on community /private lands
- (4) Block Plantations: Plantation patches covering an area of more than 0.1 ha and not falling in any of above categories.
- (5) Pond-side Plantations: Trees planted in and around ponds
- (6) Railway-side Plantations: Trees planted along railway lines
- (7) Canal-side Plantations: Trees planted along canals.
- (8) Others: Trees not falling in any of the above categories

2.7 VERIFICATION OF DATA:

The data collected from selected sample villages in various field Forms by field parties were counter checked in the field by Supervisory Staff and Group Officer and sent to Zonal Office at regular intervals. Data were further verified for errors, if any, and rectified in the technical wing. The field forms were thereafter sent to Data Processing Unit of Headquarter, Dehradun (FSI), where the data was processed and various stand and stock tables were generated. The abstract of data collected from 4 sample villages of Narsimhapur district is mentioned below:

Table 2.2: ABSTRACT OF DATA COLLECTED FROM SAMPLE VILLAGES.

S. No.	Name of sample village	S. No. of the village	Area of sample village (Ha.)	No. of trees enumerated	No. of enumerated bamboo clumps
1.	Dighori	266	734.427	2895	66
2.	Hathini	31	243.002	472	15
3.	Maresar	332	1012.293	2773	27
4.	Umeria	256	231.807	7460	10
	Total	-	2221.529	13600	118

CHAPTER - III

DATA PROCESSING

3.1 PROCESSING OF DATA:

After completion of field work, the data collected in field forms from sample villages were consolidated and checked for inconsistency and coding mistakes, if any. The data from each sample village was entered in personal computer and the distribution of trees in each diameter class for each category of trees was obtained species-wise. For this purpose, the software package d Base IV was used. Data was analysed by using ratio method of estimation to arrive at the final estimation. Since many of the trees in the district occurred in small numbers, they were clubbed together under Miscellaneous species. For Narsimhahpur district, 19 main species were selected for calculating their stand and stock on the basis of their numerical occurrence, commercial and regional importance.

3.2 AREA COMPUTATION:

Non-forest area of the district was calculated by subtracting forest area (1383 sq. km.) from the total geographical area (5133 sq. km.) which comes to 3750 sq. km.

3.3 VOLUME ESTIMATION:

To estimate the volume of trees in non-forest areas, a local volume table was generated by using the local volume equation developed during the forest inventory of the district. A copy of the local volume table so generated is annexed to this report.

CHAPTER – IV

ESTIMATION OF GROWING STAND AND STOCK

4.1 ESTIMATION:

The Narasimhapur district having 5133 sq. km. geographical area and 3750 sq km. non-forest area, has a total number of 1081 villages. Based on the pilot survey in the State, 4 sample villages were selected in this district for non-forest inventory. The sample villages had an aggregated area of 2221.529 ha. (22.22 sq. km.). On the basis of data collected from these four sample villages, the estimation of total growing stand (stems) and stock (volume) has been made for the entire non forest area (3750 sq. km.) of the district. The data was analysed in respect of tree stand & stock parameters besides calculating number of stems per hectare and volume per hectare. The growing stand/stock has been estimated for 19 species which contributed significantly and for the remaining species, having small contribution, the growing stand/stock has been merged under miscellaneous species. The results reveal that there are a total of 1146824 trees @ 3.07 stems/ha with a corresponding volume of 990087 M³ @ 2.64 M³/ha in the entire non-forest area of the district.

4.2 GROWING STAND:

Growing stand is the total number of stems and stems per hectare. The category-wise, species-wise/diameter class-wise (for all categories combined), total stems and stems/ha., has been given in the tables annexed to this report later. An abstract of estimated category-wise growing stand in the entire non-forest area of the district is given below (Table No. 4.1):

Table 4.1: ESTIMATED GROWING STAND IN NFA OF NARSIMHAPUR DISTRICT.

S. No.	Categories	Total no. of trees	Stems/Ha	% of stems
1.	Farm Forestry	574179	1.54	50.07
2.	Roadside Plantations	31309	0.08	2.73
3.	Village woodlots	497198	1.33	43.35
4.	Block plantations	41524	0.11	3.62
5.	Pond-side Plantations	2530	0.01	0.22
6.	Canal-side Plantations	84	0.00	0.01
	Total	1146824	3.07	100

There are about 11.47 lakh trees of different species and diameter classes all over the non-forest areas of Narsimhapur district and contribution of Farm Forestry alone to this stand is 50.07% followed by village woodlots 43.35%.

4.3 GROWING STOCK:

The growing stock is the cubical content or the volume that a growing stand could yield. The growing stock in the entire non-forest area of the district has been estimated using local volume table generated by applying local volume equation generated during forest inventory of Narsimhapur and neighbouring districts of Madhya Pradesh owing to non availability of local volume table for Narsimhapur district with the State Forest Department or Forest Survey of India. The detailed category-wise, species and diameter class-wise (all categories combined) volume and volume/ha of trees are given in the tables annexed to this report later. However, an abstract of category-wise estimated volume in the non-forest area of the district is given below (Table No. 4.2):

Table 4.2: ESTIMATED GROWING STOCK IN NFA OF NARSIMHAPUR DISTRICT.

S. No.	Categories	Total no. of trees	Volume (M ³)	Volume/ Ha.	% of volume
1.	Farm Forestry	574179	424509	1.14	42.88
2.	Road-side plantations	31309	34625	0.09	3.50
3.	Village woodlots	497198	491100	1.31	49.60
4.	Block plantations	41524	38047	0.10	3.84
5.	Pond-side Plantations	2530	1673	0.00	0.17
6.	Canal-side Plantations	84	133	0.00	0.01
	Total	1146824	990087	2.64	100

In terms of volume also the major contribution is from Village woodlots 49.60% followed by Farm Forestry 42.88%. In terms of number of trees, the Farm Forestry has highest share i.e. 50.07% but in terms of volume it has second position. This is because of the fact that village woodlots though having lesser share in number of trees 43.35%, has trees of bigger girth compared to trees existing in farm forestry.

4.4 CONCLUSION:

The results of the survey of non-forest area in Narsimhapur district reveal that there is a substantial tree growth i.e. more than 11 lakhs constituting about 9 lakh 90 thousand cubic meter of wood to meet the local demand of timber and fuel wood. Such tree growth helps to bring down the dependency of the local people on the Govt. forests to a large extent particularly in a situation where forest wealth is depleting day by day due to the rise in population and consequent increase in the demand for forest produce. The growing stock in non-forest areas thus play a very important role in fulfilling the demands of the local population for timber and fuelwood. Apart from meeting their requirements of timber and fuelwood, the villagers also derive some income by selling timber and fuelwood to other consumers in the village who do not have sufficient trees growing in their farm lands or to the nearest townships/villages. Thus, the village forest helps the villagers in improving their socio-economic conditions. There is therefore, an urgent need to encourage the villagers to grow more and more trees in the villages apart from the departmental efforts through social forestry programmes.

ANNEXURE - I

LOCAL VOLUME TABLE FOR NARSIMHAPUR DISTRICT

S.NO	NAME OF SPECIES	DIAMETER CLASS						
		10-20	20-30	30-40	40-50	50-60	60-70	70+
1	Acacia arabica	0.108	0.405	0.903	1.588	2.445	3.460	4.619
2	Acacia catechu	0.095	0.439	0.673	1.180	1.833	2.631	3.574
3	Acacia leucocephala	0.108	0.405	0.903	1.588	2.445	3.460	4.619
4	Albizzia lebbeck	0.108	0.405	0.903	1.588	2.445	3.460	4.619
5	Albizzia procera	0.108	0.405	0.903	1.588	2.445	3.460	4.619
6	Azadirachta indica	0.108	0.405	0.903	1.588	2.445	3.460	4.619
7	Eucalyptus sp (hybrid)	0.108	0.405	0.903	1.588	2.445	3.460	4.619
8	Ficus sp.	0.108	0.405	0.903	1.588	2.445	3.460	4.619
9	Lannea coromandelica	0.108	0.439	0.995	1.754	2.698	3.806	5.059
10	Maduca latifolia	0.071	0.323	0.878	1.853	3.365	5.529	8.461
11	Mangifera indica	0.108	0.405	0.903	1.588	2.445	3.460	4.619
12	Moringa oilifera	0.108	0.405	0.903	1.588	2.445	3.460	4.619
13	Phoenix sylvestris	0.108	0.405	0.903	1.588	2.445	3.460	4.619
14	Syzygium cumini	0.108	0.405	0.903	1.588	2.445	3.460	4.619
15	Tamarindus indica	0.108	0.405	0.903	1.588	2.445	3.460	4.619
16	Tectona grandis	0.394	0.691	1.186	1.879	2.771	3.861	5.149
17	Terminalia arjuna	0.108	0.405	0.903	1.588	2.445	3.460	4.619
18	Terminalia belerica	0.133	0.491	1.076	1.887	2.925	4.188	5.679
19	Zizyphus mauritiana	0.108	0.405	0.903	1.588	2.445	3.460	4.619
20	Misc.	0.108	0.405	0.903	1.588	2.445	3.460	4.619

ANNEXURE - II

DISTRIBUTION OF ESTIMATED TREES IN NON-FOREST AREA OF NARSIMHAPUR DISTRICT

NON-FOREST AREA OF THE DISTRICT - 375000 HA AREA OF THE VILLAGES SURVEYED - 2222 HA
ALL CATEGORIES COMBINED

S.No.	Name of Species	Diameter Class										Total	% of Trees	Stems/Ha.
		10-20	20-30	30-40	40-50	50-60	60-70	70+	70+	70+	70+			
1	Acacia arabica	120187	73006	40511	14601	4051	1097	422	253875	22.14	0.68			
2	Acacia catechu	2363	928	0	0	0	0	0	3291	0.29	0.01			
3	Acacia leucocephala	5148	3544	2362	1351	844	168	253	13670	1.19	0.04			
4	Albizzia lebbeck	253	168	0	84	0	0	0	505	0.04	0			
5	Albizzia procera	675	675	169	253	253	0	0	2025	0.18	0.01			
6	Azadirachta indica	8777	7089	3460	1941	675	506	760	23208	2.02	0.06			
7	Eucalyptus sp (hybrid)	4304	3713	506	168	0	0	0	8691	0.76	0.02			
8	Ficus species	6161	4811	4051	1773	2025	337	2110	21268	1.85	0.06			
9	Lannea coromandelica	169	337	169	0	84	0	0	759	0.07	0			
10	Madhuca latifolia	1013	1097	1942	3292	2194	1519	6330	17387	1.52	0.05			
11	Mangifera indica	11225	11226	6752	4895	7596	6752	21523	69969	6.10	0.19			
12	Moringa oilifera	1351	1181	928	168	0	0	0	3628	0.32	0.01			
13	Phoenix sylvestris	84	1181	6076	928	84	0	0	8353	0.73	0.02			
14	Syzygium cumini	2617	3292	2617	1351	506	759	1857	12999	1.13	0.03			
15	Tamarindus indica	591	422	337	507	675	591	2279	5402	0.47	0.01			
16	Tectona grandis	67268	66339	63555	35786	14686	4557	3967	256158	22.33	0.68			
17	Terminalia arjuna	8693	11226	12491	9621	4136	2363	2363	50893	4.43	0.14			
18	Terminalia belerica	590	507	422	338	506	0	338	2701	0.24	0.01			
19	Zizyphus mauritiana	48868	21353	5233	1266	760	0	0	77480	6.76	0.21			
20	Misc. sp.	198765	63553	23632	12070	5232	2195	9115	314562	27.43	0.84			
	Total	489102	275648	175213	90393	44307	20844	51317	1146824	100	3.07			
	% of Trees	42.65	24.04	15.28	7.88	3.86	1.82	4.47	100					
	Stems per Ha.	1.30	0.74	0.47	0.24	0.12	0.06	0.14	3.07					

ANNEXURE - III

DISTRIBUTION OF ESTIMATED TREES IN NON-FOREST AREA OF NARSIMHAPUR DISTRICT

NON-FOREST AREA OF THE DISTRICT - 375000 HA

AREA OF THE VILLAGES SURVEYED - 2222 HA

ALL DIAMETER CLASS COMBINED

S.No.	Name of Species	Category										Total	% of Trees	Stems/Ha		
		I	II	III	IV	V	VI	VII	VIII							
1	Acacia arabica	125589	16879	110817	84	506	0	0	0	0	0	0	0	253875	22.14	0.68
2	Acacia catechu	3038	0	253	0	0	0	0	0	0	0	0	0	3291	0.29	0.01
3	Acacia leucocephala	168	1181	12321	0	0	0	0	0	0	0	0	0	13670	1.19	0.04
4	Albizia lebbeck	421	0	84	0	0	0	0	0	0	0	0	0	505	0.04	0
5	Albizia procera	1773	0	252	0	0	0	0	0	0	0	0	0	2025	0.18	0.01
6	Azadirachta indica	14432	928	7848	0	0	0	0	0	0	0	0	0	23208	2.02	0.06
7	Eucalyptus sp (hybrid)	7004	1350	337	0	0	0	0	0	0	0	0	0	8691	0.76	0.02
8	Ficus species	12322	0	8356	506	84	0	0	0	0	0	0	0	21268	1.85	0.06
9	Lannea coromandelica	422	0	337	0	0	0	0	0	0	0	0	0	759	0.07	0
10	Madhuca latifolia	6331	0	11056	0	0	0	0	0	0	0	0	0	17387	1.52	0.05
11	Mangifera indica	50219	3291	5149	11226	84	0	0	0	0	0	0	0	69969	6.10	0.19
12	Moringa olifera	590	0	3038	0	0	0	0	0	0	0	0	0	3628	0.32	0.01
13	Phoenix sylvestris	2193	506	5232	0	422	0	0	0	0	0	0	0	8353	0.73	0.02
14	Syzygium cumini	5064	929	7006	0	0	0	0	0	0	0	0	0	12999	1.13	0.03
15	Tamarindus indica	2534	506	2362	0	0	0	0	0	0	0	0	0	5402	0.47	0.01
16	Tectona grandis	55030	0	201044	84	0	0	0	0	0	0	0	0	256158	22.33	0.68
17	Terminalia arjuna	25911	0	24898	0	0	0	0	0	0	0	0	0	50893	4.43	0.14
18	Terminalia belerica	1773	0	928	0	0	0	0	0	0	0	0	0	2701	0.24	0.01
19	Zizyphus mauratiana	42369	3207	30807	0	1097	0	0	0	0	0	0	0	77480	6.76	0.21
20	Misc. sp.	216996	2532	65073	29624	337	0	0	0	0	0	0	0	314562	27.43	0.84
	Total	574179	31309	497198	41524	2530	0	84	0	0	0	0	0	1146824	100	3.07
	% of Trees	50.07	2.73	43.35	3.62	0.22	0	0.01	0	0	0	0	0	100		
	Stems per Ha.	1.54	0.08	1.33	0.11	0.01	0	0	0	0	0	0	0	3.07		

ANNEXURE - IV

DISTRIBUTION OF ESTIMATED TREES IN NON-FOREST AREA OF NARSIMHAPUR DISTRICT

NON-FOREST AREA OF THE DISTRICT - 375000 HA

AREA OF THE VILLAGES SURVEYED - 2222 HA

ALL SPECIES COMBINED

S.No.	Category	Diameter Class										Total	% of Trees	Stems/Ha
		10-20	20-30	30-40	40-50	50-60	60-70	70+						
1	Farm Forestry	265524	148294	75285	34521	18398	8186	23971	574179	50.07	1.54			
2	Road-side plantations	11900	7089	3881	2700	1265	928	3546	31309	2.73	0.08			
3	Village woodlot	181631	117397	94613	51991	22450	9367	19749	497198	43.35	1.33			
4	Block Plantations	28612	2447	1097	928	2194	2363	3883	41524	3.62	0.11			
5	Pond-side plantations	1435	421	337	169	0	0	168	2530	0.22	0.01			
6	Canal-side plantations	0	0	0	84	0	0	0	84	0.01	0			
	Total	489102	275648	175213	90393	44307	20844	51317	1146824	100	3.07			
	% of Trees	42.65	24.04	15.28	7.88	3.86	1.82	4.47	100					
	Stems Per Ha.	1.3	0.74	0.47	0.24	0.12	0.06	0.14	3.07					

ANNEXURE - V

DISTRIBUTION OF ESTIMATED VOLUME OF TREES IN NON-FOREST AREA OF NARSIMHAPUR DISTRICT

NON-FOREST AREA OF THE DISTRICT - 375000 HA

AREA OF THE VILLAGES SURVEYED - 2222 HA

ALL CATEGORY COMBINED

S.No.	Name of Species	Diameter Class										% of Volume	Volume Per Ha
		10-20	20-30	30-40	40-50	50-60	60-70	70+	Total				
1	Acacia arabica	12980	29567	36581	23186	9905	3795	1949	117963			11.91	0.31
2	Acacia catechu	224	408	0	0	0	0	0	632			0.06	0.00
3	Acacia leucocephala	556	1435	2133	2146	2063	582	1169	10084			1.02	0.03
4	Albizzia lebeck	27	68	0	133	0	0	0	228			0.02	0.00
5	Albizzia procera	73	273	153	401	619	0	0	1519			0.15	0.00
6	Azadirachta indica	948	2871	3124	3083	1650	1751	3510	16937			1.71	0.05
7	Eucalyptus sp (hybrid)	465	1503	457	266	0	0	0	2891			0.27	0.01
8	Ficus species	666	1948	3658	2816	4951	1166	9746	24951			2.52	0.07
9	Lannea coromandelica	18	148	168	0	227	0	0	561			0.06	0.00
10	Madhuca latifolia	72	354	1705	6100	7383	8398	53558	77570			7.84	0.21
11	Mangifera indica	1213	4546	6098	7773	18572	23361	99414	160977			16.26	0.43
12	Moringa olifera	146	478	838	266	0	0	0	1728			0.17	0.00
13	Phoenix sylvestris	9	478	5486	1473	205	0	0	7651			0.77	0.02
14	Syzygium cumini	283	1333	2363	2145	1236	2626	8577	18563			1.88	0.05
15	Tamarindus indica	64	171	304	805	1650	2044	10527	15565			1.57	0.04
16	Tectona grandis	26504	45841	75377	67242	40695	17594	20426	293679			29.66	0.78
17	Terminalia arjuna	939	4547	11279	15278	10112	8176	10915	61246			6.19	0.16
18	Terminalia belerica	78	249	454	638	1480	0	1920	4819			0.49	0.01
19	Zizyphus mauratiana	5278	8648	4725	2011	1858	0	0	22520			2.28	0.06
20	Misc. sp.	21467	25739	21341	19167	12792	7595	42102	150203			15.17	0.40
	Total	72010	130605	176244	154929	115398	77088	263813	990087			100	2.64
	% of Volume	7.27	13.19	17.8	15.65	11.65	7.79	26.65	100				
	Stems Per Ha.	0.19	0.35	0.47	0.41	0.31	0.21	0.70	2.64				

ANNEXURE - VI

DISTRIBUTION OF ESTIMATED VOLUME OF TREES IN NON-FOREST AREA OF NARSIMHAPUR DISTRICT

NON-FOREST AREA OF THE DISTRICT - 375000 HA

AREA OF THE VILLAGES SURVEYED - 2222 HA

ALL DIAMETER CLASS COMBINED

S.No.	Name of Species	Category								Total	% of Volume	Volume per Ha.
		I	II	III	IV	V	VI	VII	VIII			
1	Acacia arabica	71846	10004	35890	76	147	0	0	0	117963	11.91	0.31
2	Acacia catechu	579	0	53	0	0	0	0	0	632	0.06	0
3	Acacia leucocephala	85	1791	8208	0	0	0	0	0	10084	1.02	0.03
4	Albizia lebeck	194	0	34	0	0	0	0	0	228	0.02	0
5	Albizia procera	1343	0	176	0	0	0	0	0	1519	0.15	0
6	Azadirachta indica	7818	2393	6726	0	0	0	0	0	16937	1.71	0.05
7	Eucalyptus sp (hybrid)	2185	395	111	0	0	0	0	0	2691	0.27	0.01
8	Ficus species	11274	0	13209	80	388	0	0	0	24951	2.52	0.07
9	Lannea coromandelica	129	0	432	0	0	0	0	0	561	0.06	0
10	Madhuca latifolia	30698	0	46872	0	0	0	0	0	77570	7.84	0.21
11	Mangifera indica	108178	11846	7720	33224	9	0	0	0	160977	16.26	0.44
12	Moringa olifera	329	0	1399	0	0	0	0	0	1728	0.17	0
13	Phoenix sylvestris	1830	514	4811	0	496	0	0	0	7651	0.77	0.02
14	Syzygium cumini	5656	2120	10787	0	0	0	0	0	18563	1.88	0.05
15	Tamarindus indica	5664	1775	8126	0	0	0	0	0	15565	1.57	0.04
16	Tectona grandis	53776	0	239845	58	0	0	0	0	293679	29.66	0.78
17	Terminalia arjuna	24335	0	36778	0	0	0	133	0	61246	6.19	0.16
18	Terminalia belerica	3082	0	1737	0	0	0	0	0	4819	0.49	0.01
19	Zizyphus mauritiana	11834	696	9797	0	193	0	0	0	22520	2.28	0.06
20	Miscellaneous species	83674	3091	58389	4609	440	0	0	0	150203	15.17	0.40
	Total	424509	34625	491100	38047	1673	0	133	0	990087	100	2.64
	% of Volume	42.88	3.50	49.60	3.84	0.17	0	0.01	0	100		
	Volume per Ha.	1.14	0.09	1.31	0.10	0	0	0	0	2.64		

ANNEXURE - VII

DISTRIBUTION OF ESTIMATED VOLUME IN NON-FOREST AREA OF NARSIMHAPUR DISTRICT

NON-FOREST AREA OF THE DISTRICT - 375000 HA

AREA OF THE VILLAGES SURVEYED - 2222 HA

ALL SPECIES COMBINED

S.No.	Category	Diameter Class								Total	% of Volume	Volume per Ha
		10-20	20-30	30-40	40-50	50-60	60-70	70+				
1	Farm Forestry	34805	64084	70924	56563	46895	29467	121771	424509	42.88	1.14	
2	Road-side plantations	1284	2870	3505	4286	3091	3211	16378	34625	3.50	0.09	
3	Village woodlot	32675	62466	100520	92205	60048	36234	106952	491100	49.60	1.31	
4	Block Plantations	3091	1015	991	1474	5364	8176	17936	38047	3.84	0.10	
5	Pond-side plantations	155	170	304	268	0	0	776	1673	0.17	0	
6	Canal-side plantations	0	0	0	133	0	0	0	133	0.01	0	
	Total	72010	130605	176244	154929	115398	77088	263813	990087	100	2.64	
	% of Volume	7.27	13.19	17.80	15.65	11.65	7.79	26.65	100			
	Volume per Ha.	0.19	0.35	0.47	0.41	0.31	0.21	0.70	2.64			

ANNEXURE- VIII

FORM NO.1

Data collection on village forest (outside green wash area)

Mapsheet No.:

Name of Village:

Tahsil:

District:

Range:

Forest Division:

Circle:

1 Reference point for Village:

(Mention distance from the nearest Railway/Bus Station etc.

2 Area planted by Social Forestry Department/Individuals etc.

- a. Village Woodlots
- b. Rehabilitation of degraded forest
- c. Rural fuelwood
- d. Any other schemes
- e. Vanmahotsava etc.

3 Category of the Village

4 Land use

Area under: Ha.

1. Habitation i.e. School, colleges, Hospital, Play ground, Samshan etc.

2. Cultivation

- A. Irrigated
- B. Non-irrigated

3. Fallow lands including pasture lands,
waste lands, water body, ravines etc.

4. Strips.

- A. Road (Mention National/State/Other Highways)
- B. Railway
- C. Canal
- D. Others

Total Area

Signature

Name

Designation

Date: ____ / ____ / ____

ANNEXURE -IX

VILLAGE DESCRIPTION FORM

1. State:
2. District:
3. Mapsheet No.:
4. Sample Village:
5. Area of the sample village (in Ha.):
6. Crew Leader (Name):
7. Date of commencement of survey:
8. Date of completion of survey:
9. Conspicuous feature selected as the centre for starting the survey:
10. Description of the centre and approach to this point:
11. Number of angular quadrants formed in the sample village:
12. Compassing done by (Name):
13. Tree enumeration done by (Name):
14. Height measurements taken by (Name):
15. Quadrant-wise summary of enumerations:

Quadrant No.	Date of survey	No. of trees enumerated
1		
2		
3		
4		
Total		

Date

Name & Signature of the Crew Leader

Rough diagram of sample village

ANNEXURE - X

DISTRICT TREE FORM

Job No.	Card Design Number	State	District	No. of Villages in the district	No. of sample Villages in the district	Geographical area of the district (Ha)	Sample Village	Geo. Area of the sample village (Ha)	Category of the sample village
1-3	4-6	7-8	9-10	11-15	16-17	18-22	23-27	28-31	32

Number of trees in the sample village according to category of the plantation/tract.

Farm forestry	Road-side plantations	Village woodlots	Block plantations	Pond-side plantations	Railway-side plantations	Canal-side plantations	Rest	Total
33-36	37-40	41-44	45-48	49-52	53-56	57-60	61-64	65-70

Page No.....
Total No. of Pages.....

Signature of the Crew Leader.....
Name of the Crew Leader.....

**ANNEXURE - XIII
BAMBOO WEIGHT FORM**

Job Number	Card Design	Mapsheet No.	Grid No.	Plot No.
1-3	4-5	6-11	12-15	16

Spp. Code	Sample No.	Green Weight of Culms										Green weight of Sub-sample for Co-relation with dry wt.										
		Diameter Class					8 cm and above					Sub Sample Culm 2 and under 5 cm dia.	Sub Sample Culm 5 and under 8 cm dia.	Sub Sample Culm 8 cm and above								
		2 to under 5 cm		5 to under 8 cm		Dia. (cm)	Total Length (Dmt)	Utilizable Length (Dmt)	Weight (Grams)	8 cm and above												
16-19	20	Dia. (cm)	21-22	Total Length (Dmt)	23-25					26-28	29-31	32-36	37-38	39-41	42-44	45-47	48-52	53-54	55-57	58-60	61-63	64-68

Date:

Name & Signature of the Crew Leader: