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REPORT ON

FOREST RESOURCES OF

SINGHBHUM DISTRICT

OF JHARKHAND STATE

FOREST SURVEY OF INDIA
EASTERN ZONE
KOLKATA
2001

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PREFACE

This report pertains to the forest resources of undivided Singhbhum district (of present Jharkhand) of Bihar State and is the result of an intensive field survey carried out by the staff of the Eastern Zone of the Forest Survey of India during the year 1995 – 96

The geographical area of the district is 13440 sq km The recorded forest area according to Bihar Forest Department is 4463 11 sq km (i e 33 21% of the geographical area) According to the survey conducted by this organization, the area actually covered by tree forest vegetation is 3598 09 sq km (26 77% of the total geographical area of undivided Singhbhum district) It appears that destruction of forests in this district is taking place due to cultivation, encroachments and illicit felling

The report incorporates details of the area surveyed, methodology adopted, findings, conclusion and comparison with the earlier surveys The total growing stock of the forest in the district has been estimated at 15 638 million m^3 and the volume per ha at 43 46 m^3 The total number of stems has been estimated as 78 64 million and the number of stems per ha. as 218 57 Stratum-wise figures are available in the report

Officers and staff members of Eastern Zone of Forest Survey of India who were entrusted with carrying out the inventory and bringing out the report in the present form, deserve much appreciation for their efforts The co-operation and help extended by the State Forest Department of Bihar is thankfully acknowledged

It is hoped that this report will provide necessary inputs and facilitate forest resource management and planning by all concerned department and agencies in the State.

(Dr J K Rawat)
Director

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FOREST SURVEY OF INDIA
EASTERN ZONE
KOLKATA

ACKNOWLEDGEMENT

This organization is extremely thankful and expresses gratitude to the forest officers and field staff of the Forest Department of Bihar State who rendered all possible cooperation to the field parties of our organization during the survey period without which it would not have been possible to complete the survey work in stipulated time We are also thankful to the Deputy Commissioner and Superintendent of Police, Singhbhum District and other officials of Bihar administration who extended all possible help to our field parties Thanks are also expressed to the Dy Directors and staff members of Forest Survey of India, Eastern Zone, who were entrusted with carrying out the field inventory and bringing out the report in the present form

(Madhawa Trivedy)
Regional Director

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(MAIN REPORT WITH MAPS,CHARTS & DIAGRAMS)

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CHAPTER: I
BACKGROUND INFORMATION

1.1 INTRODUCTION:

Natural vegetation in the shape of forests is the best gift of nature to mankind and has served as the cradle of human civilization The natural eco – system consists of all biotic and abiotic components held in a state of perpetual balance The eco-system has the inherent capacity to heal itself, if disturbed within limits However, any major damage can disturb the delicate balance irreversibly resulting in serious threat to its components, including human beings As a result of this, attention of both Government and right thinking people is now focussed to take proper care of this ecological system Rising population and its demand on forest products are increasing day by day and therefore. a detailed assessment of valuable forest resources of Singhbhum district was felt necessary Forest Survey of India (Eastern Zone) undertook forest inventory work of Singhbhum district during the year 1995-96 This report is based on the data collected during the inventory, and on other published information in District Statistical Handbooks, District Gazetteers and Forest Department Publications

1.2 LOCATION AND BOUNDARY

The present inventory pertains to the forest resources of the erstwhile Singhbhum district of Bihar State, which has now been split into two separate districts, e g Purbi and Paschimi Singhbhum districts The location of the district is shown in the map. The results and findings are worked out on the basis of undivided Singhbhum district because of similarity in forest composition and vegetation status The total geographical area of the undivided Singhbhum district is 13440 sq km The name Singhbhum is, the land of the Singhs, is most probably derived from the patronymic of the Rajas of Porahat, to whom the north of the district was once subjected Another theory is that the name is a corruption of Singh Bonga, the principal God head of the Hos, the adiyasis of Singhbhum district The district is situated between 21°58' and 23°36' north latitude and between 85°0' and 86°54' east longitude The district is bounded on the east by Midnapore district of West Bengal, on the west by Ranchi district and portions of Orissa State, on the north by the districts of Ranchi

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and Purulia and on the south by portions of some of the districts of Orissa State e g Mayurbhanj, Keonjhar and Bonai The river Subarnarekha marks a portion of the northern and southern boundaries, and one of its tributaries the Godia, separates Singhbhum from the feudatory estate of Mayurbhanj, which is now a district in Orissa for some distance on the South-east. On the extreme north west the North Karo and Phuljhar rivers form a natural boundary between Singhbhum and Ranchi district

1 3 LAND CONFIGURATION

The district forms part of the southern fringe of the Chotanagpur plateau and is a hilly upland tract There are steep mountains, and deep forests on the slope of the hills and also in the river basin The highest peaks in the north west have an altitude of 762 metre and the south west there is a mass of hills rising to a height of nearly 915 metres known as 'Saranda Pir'. The area still remains one of the biggest sanctuaries for wild life in India The centre of the district consists of an upland plateau enclosed by hill ranges of no high altitude The central strip extending from the Subarnarekha river on the east to the Angarbira range at the west of Chaibasa is one of the most fertile parts of the Singhbhum region. There is a fairly extensive undulating plain formed by the Sajai valley in the north. In the forests the wooded glens and valleys traversed by rivers and hill streams, have a peculiar charm These glens are at their best in the cold weather, when the clear spring fed water ripples down over a rock strewn bed, or gently glides through brakes of reed or grass, between high banks fringed with ferns and mosses

1 4 GEOLOGY AND ROCK

The following three are the most important geological formations which occur in the district

i) Granites and gneisses of Archaean age intrusive into the oldest sedimentary rocks, now highly metamorphosed and known as the Singhbhum granite and gneiss and the Chotonagpur granite-gneiss

ii) The iron ore series which are mostly metamorphosed, ancient sediments with contemporaneous basic

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igneous rocks and are equivalent to a large part of the Dharwar system of Indian Geology.

iii) The volcanic lava flows of the Dalma hill and its adjoining ranges.

The greater part of the district is covered with rocks of the Iron-ore series and granite rocks. Granite rocks occur in the south-east over a considerable area and along a small patch north of Chakradharpur. The plains of Singhbhum are partly on granite and partly on the schist and shales of the iron series. The shales, which mostly form the central and southern parts of the Singhbhum plains, merge into the hills of the Kolhan in the south and into those of the Porahat to the West. A series of shale and quartzite hills extend into the Singhbhum plains to the south east of Chakradharpur and connect the southern outcrops of the iron ore series with the outcrops in the north.

1.5 RIVER SYSTEM:

The district is drained by three river systems, those of the Subarnarekha, Baitarini and Brahmani. The water sheds of these three systems originate near Gamharia the Kolhan and radiate north-west, south-west and east respectively from their common centre. All the rivers are fordable throughout the year, except for a few hours at a time during the monsoon when they rise and fall suddenly after heavy rains. The banks are generally steep, and the beds are almost always strewn with boulders. Sand, however, is found in the Koel and Subarnarekha and in parts of the Kharkai and Sanjai. None of the rivers dry up altogether in the hot season, but in most of them the water level is very low. Besides the above mentioned river, the Roro and Koina are important. The Koina, however, contains plenty of water even in the height of the summer season when no rain has fallen for many months because it has many more feeder streams than the Sanjai. The north Karo also rises near Ranchi and has a course of about 19 km in the district, draining the hills of Porahat. The south Karo rises in Keonjhar district of Orissa and has a course of 60km in Singhbhum district. Deo river rises in the Kolhan on the western side of Ganharia plateau and flows into the south Karo river after a course of 56 km.

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1 6 CLIMATE

The climatic condition of the district may be divided into three seasons The winter season from November to February, the summer season from March to May and monsoon season from June to October

In the winter season, the early mornings and nights are cold and the minimum temperature goes down to 4°C or even lower The cold season is delightful while the summer is unpleasantly hot with the hot westerly winds prevailing The barrier of hills in the south-east, prevents sea breeze to penetrate and the atmosphere is generally dry Rainfall is the maximum in the months of July and August The annual average rainfall in the district is about 1422 mm . Monsoon generally breaks in the second week of June December and January are the coldest months while April and May are the hottest

Humidity is usually low dipping to 15% or lower in some months During the period from February to June, violent storms from the north west called 'nor'wester' occur along with thunder, lightening, rain and occasional hail.

1 7 MINERAL RESOURCES

Singhbhum district is very rich in mineral resources The greater part of the district is covered by the iron-ore series and granite rocks The minerals found in the district are the ores of iron, manganese, copper, asbestos, uranium mineral, chromite, gold, magnatite, limestone, mica, kyanite, soapstone and clay minerals which have different chemical compositions and variations in essential physical properties

The whole of the iron ore mine, is almost entirely haematite (massive steel grey type) with 69% iron, varying through a porous shale type produced by the leaching out of the silicious layers and carrying 60% iron Dolomite and chert occur with manganese deposits south of Nalda and dolomite occurs near Chaibasa Asbestos is found in several places in Seraikela and Dhalbhum Copper was in a hill near Narayanpur in Seraikela Gold veins have been worked at Kendorkocha in Dhalbhum There is also a belt along the southern border of Dhalbhum from Kendarkocha westwards into Seraikela The chromite mines are found at Kittaburu where chromite is worked at the surface as well as underground

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1 8 FORESTS

Majority of the forest is moist tropical deciduous which tends to be dry deciduous on the ridges Shorea robusta is the most important and predominant species and grows gregariously in almost all types of soil Natural bamboos are also found in a highly degraded condition The forests of the district can be classified as follows

a) Northern dry deciduous forests(5B/C2) with sub-types VI and VII This type is found on steep slopes and southern aspects. Species found are Lannea coromandelica, Sterculia urens, Buchanania lanzan, Anogeissus latifolia, Largerstroemia parviflora, Adina cordifolia, Schleichera oleosa etc

b) Dry peninsular Sal forests(5B/C1C) with Sub type (i) and (ii) This type of forest is seen on valley slopes with varying aspects Important species found are Shorea robusta, Anogeissus latifolia, Boswellia serrata, Zizyphus Zylopyra, Madhuca latifolia etc.

c) Moist peninsular Sal forest(3C/C2c) with sub-type(I),(ii) and (iii). This type of forest is seen in the middle, lower slopes or sheltered positions in northern aspect Important species found are Shorea robusta, Syzygium cumini, Dendrocalamus strictus, Bauhinia spp., Terminalia tomentosa Cedrela toona, Callicarpa arborea, Adina cordifolia, Gmelina arborea, Diospyros melanoxylon etc

d) Moist mixed deciduous forest (3C/C 3 a) The species found are Terminalia alata, Diospyros peregrina, Kydia calycina, Mallotus philippinensis, Colebrookia oppositifolia etc.

e) Northern tropical evergeen and semi-evergreen forests(1B/2B) This type of forest is found in narrow belt along the perennial streams Species found are Litsaea species, Michelia champaca, macaranga peltata etc

f) Dry deciduous scrub forests(5B/Ds_1) Species found are Shorea robusta, Buchanania lanzan, Terminalia tomentosa, Boswellia serrata etc.

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1 9 DEMOGRAPHY AND SOCIO-ECONOMY

In 1991, the old district of Singbhum was split into two districts purbi (East) Singhbhum and paschimi (West) Singhbhum and the steel city of Jamshedpur and its adjoining industrial areas fall in purbi Singhbhum

The population and the literacy rate of purbi Singhbhum and paschimi Singhbhum districts as per 1991 Census are given below

Table 1

District		Total population			Literacy rate(7+)		
Purbi		Persons	Males	Females	Persons	Males	Females
Singhbhum	Total	1613088	846456	766632	59.05	71.18	45.50
	Rural	763172	389521	373651	38 20	54 32	21 36
	Urban	849916	456935	392981	77 02	84.89	67.73
Paschimi	Total	1787965	909796	878159	38 92	54.75	22.44
Singhbhum	Rural	1505540	758219	747321	32 46	48.99	15.68
	Urban	282415	151577	130838	71 69	81 84	59 65

The Scheduled castes and Scheduled tribes population of purbi Singhbhum district as per 1991 Census is 77194 persons and 466572 persons respectively. The same in paschimi Singhbhum district are 89496 and 978069 persons respectively

The major portion of both the districts consists either of agricultural or mining areas producing iron ore and other ancilliary minerals for the manufacture of iron and steel The main occupation of the people of the two districts is cultivation, but at the same time forests, iron ore projects, Tata Steel plant, Telco and other small feeder industries in and around Tatanagar, Kiriburn and Noamundi also provide employment The copper factory near Ghatshila also engages a large number of people The other important industrial activities are bidi-making at Chakradharpur and Shellac manufacturing at Chandil There are a few establishments both in the rural and urban areas of the district engaged in manufacturing tobacco products, Flour mills, rice mills, saw mills are also functional in the region

As the forests cover a substantial area of the two districts many people who reside in or around forests, earn their livelihood through forestry work i e by collecting seeds, grass, leaves and flowers etc Moreover, a great number of the tribals and other rural folk live on wild fruits like Kendu, Sal seeds etc in summer, when food becomes scarce

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CHAPTER II
DESIGN AND METHODOLOGY

2 0 GENERAL

The inventory involves collection of a wide spectrum of information Thus, an approved manual of instructions for field inventory by Forest Survey of India, Dehradun has been followed for carrying out the survey of Singhbhum district of Bihar

2 1 AREA SELECTED FOR INVENTORY

Following areas are treated as forest areas for the purpose of forest inventory

a) Area shown in green wash on the Survey of India topo-sheets.
b) All such areas in which words such as thick jungle, open forests, bamboo etc are printed
c) All those areas indicated by dotted line or spotted line or a pillar line as forest areas
d) Any other areas reported to be forest areas by local forest department.

2 2 M APS

Forest inventory was based on the Survey of India topographical sheets The following topographical sheets were used for inventory (Scale . 1 50,000).

Sl. No.	Map sheet No.
1	73 F/1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16
2	73 E/16
3	73 G/13
4	73 I/4
5.	73 J/1,2,3,4,5,6,7,9,10,11,12,14,15,16

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2.3 SAMPLING DESIGN:

Marking of grids:

The design is systematic with a grid size of 2.5' x 2.5' of latitude and longitude with two sample plots, each of 0.1 ha. area, selected from each grid, one at random and the other linked to the first in the opposite direction at an equal distance from the grid centre. These plots form the basic sampling units. Thus, 72 plots are laid out in a toposheet with 36 grids on 1: 50,000 scale. Hence one sample plot of 0.1 ha. represents about 10 sq.km. on the ground and the intensity of sampling is 0.01%. The length of each side of the square shaped sample plot is 31.62 meters on the ground and 0.6324 mm (say 0.6 mm) on the toposheet of scale 1:50,000.

Precision and accuracy of the survey :

The result of the survey would be at the precision level of 95% probability with error limit of ± 10% at the state level.

Marking of plot center:

The method of marking of the plot centers of these two sample plots on the map in each grid of 2.5' x 2.5' is as follows:

1) First, the length and width of each grid are measured to the smallest convenient scale.
2) The length of the side of the plot on the map corresponding to a 0.1 ha. square plot on the ground is calculated. Let **X** and **Y** be the length and width of the grid and **S** the side of the plot.
3) Substract side **S** from both sides i.e. find **(X-S)** and **(Y-S).** Let these numbers be **X'** and **Y'**
4) Two random numbers, one in the range of **O to X'** and the other in the range of **O to Y'** are selected. These numbers are called **x** and **y** respectively.
5) Half of the side of the plot **(S/2)**each, are added to find **x + S/2** and **y +S/2.**

6) **x +S/2** and **y +S/2** will be the coordinates of the center of the first plot in the grid, considering the left hand bottom

corner (South - West corner) of the grid as the origin of the axes.

7) The center of the second plot is located by joining the center of the first plot with the grid center and extending this line in the opposite direction.
8) A point at an equal distance from the grid center in the opposite direction is marked. This will be the center of the second plot.

2.4 Laying out of the plot :

The plot center is the intersection of diagonals of the 0.1 ha. plot. Diagonals are aligned NW-SE and NE-SW measuring 44.72 m. each. After having approached the plot center with the help of toposheet and reference point, corners of the plot are fixed with respect to the plot center by measuring 22.36 m. in each of the directions viz. North-West, South-East,. North-East and South-West directions from the plot center. The North, East, South and Western extremities of the plot are fixed by measuring 15.81 m. from plot center in each of these direction.

- **Regeneration Survey :**

In each plot, a 4 mt x 4 mt square plot was chosen. Care was taken so that the center and diagonals of this plot coincided with the center and diagonals of the original plot. Regeneration of dominant and co dominant species was counted and noted in the following categories:

No. of seedlings 8 or more	**- Adequate regeneration**
No. of seedlings less than 8	**- Inadequate regeneration**
No. of seedlings 0	**- Absent regeneration**

2.5 DATA COLLECTION :

Data from the field is collected by an inventory crew headed by a crew leader. To visit a plot, a prominent reference point is selected in the vicinity of the plot center. The reference point is a clearly visible point both on the map as well as on the ground e.g. a nala junction or an identifiable natural feature on the spot. It is marked by a peg with appropriate markings.

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For collection of codified information from each sample plot, the following forms are used. :

♣**Plot approach form** : It gives an account of the details regarding the approach to the plot. All the details from camp site to the plot center are recorded. A prominent reference point along with its bearings is recorded which serves as an aid to reach the plot at a future date.

♣**Plot description form** : The description of several parameters such as topography, soil, land use class, forest type, regeneration, crop data etc. are collected and recorded in this form for an area of 2 ha. around the plot.

♣**Plot enumeration form** : This form is filled up for each plot. The details recorded are the name of the species, its code and diameter of the tree. Trees less than 30 cm. d.b.h. and utility less than 70% are usually not recorded. Border trees are counted "IN" when they touch NW-NE and NW-SW boundaries and considered "OUT" when they touch NE-SE and SW-SE boundary lines.

♣**Sample tree form** : Data for trees with diameter 10 cm. and above at breast height are collected from the North-West quadrant of the plot. In this form, additional data e.g. tree height, bark thickness, length of clear bole, shape of the tree etc. are recorded.

♣**Bamboo enumeration form** : This form is designed for enumeration of bamboo culms per clump. Age and soundness of culms and clump size are the parameters considered. Separate forms are used for clump forming and non-clump forming bamboos.

♣**Bamboo weight form** : The form is maintained to determine the green weight and dry weight of bamboo. For each species, mature bamboo is selected from each diameter class. 30 cm. long pieces from the bottom, middle and top are selected and their green weights recorded. These pieces are properly documented and kept in the base camp and weighed every 30 days till a constant (air dry) weight is obtained.

Since, bamboo did not occur widely (over large areas or with conspicuous presence) in Singhbhum, data on Bamboo collected there, has not been elaborately tabulated.

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CHAPTER III
DATA PROCESSING AND COMPILATION

3.0 GENERAL :

Data processing was carried out in the following three phases :

I. Manual processing
II. Input in the computer and
III. Processing on computer.

3.1 MANUAL PROCESSING :

It involves the following steps :

- Proper documentation of the field information received.
- Codification of the information in the field forms which have not already been incorporated.
- Manual checking of the information filled in the field forms.
- Reconciliation of the discrepancies with the help of the field officers.

3.2 INPUT FOR THE COMPUTER :

After manual checking, the information of the field forms was fed into the computer. The following data was stored in the hard disk for onward processing.

1. Plot description data
2. Plot enumeration data
3. Sample tree data.

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3.3 Processing on computer:

Processing on computer includes the following stages:

1. Verification of data for the creation of clean file and the Transference of the same to hard/floppy disk.
2. Consistency checking of the data on computer.
3. Correction of the data to remove discrepancies noticed during consistency checking.
4. Tabulation of plot-wise stem distribution for the district as a whole.
5. Preparation of tables of volume distribution.
6. Analysis of plot description data.
7. Calculation of standard error.

3.4 CONSTRUCTION OF VOLUME EQUATIONS:

No tree was felled during the survey of the area. Existing volume equations developed for Ranchi and Hazaribagh districts were adopted. The following equations were used for volume estimation:

Shorea robusta	$\sqrt{V} = -0.046597 + 2.227173\,D$
Anogeissus latifolia	$V = 0.028653 - 0.9768D + 11.024D^2$
Syzigium cumini	$V/D^2 = 6.2214 - 0.49647/D + 0.016042/D^2$
Adina cordifolia	$V/D^2 = 13.437 - 1.3527/D + 0.04472/D^2$
Boswellia serrata	$V/D^2 = 10.306 - 1.124/D + 0.03356/D^2$
Terminalia tomentosa	$V/D^2 = 9.4721 - 0.84158/D + 0.022389/D^2$
Rest of species	$\sqrt{V} = -0.077380 + 2.592167D$

V = total volume in m^3 (underbark)
D = Diameter at breast height in metres.

3.5 TREE VOLUME :

Volume of each enumerated tree was estimated with the help of volume equations and the calculated volume was used for generation of stock tables by species and diameter class.

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Local Volume Table:

Local volume table for some of the important species occurring in this area have been prpared, which are furnished below:-

Diameter class (in cm.)	Volume (in m^3)						
	Anogeissus latifolia	Syzygium cuminii	Adina cordifolia	Shorea robusta	Boswellia serrata	Terminalia tomentosa	Other species
10–19	0.118	0.074	0.131	0.076	0.087	0.099	0.089
20–29	0.451	0.267	0.519	0.249	0.376	0.384	0.311
30–39	1.003	0.585	1.177	0.521	0.872	0.859	0.667
40–49	1.776	1.027	2.103	0.891	1.574	1.523	1.158
50–59	2.770	1.593	3.298	1.362	2.481	2.377	1.783
60–69	3.984	2.284	4.762	1.931	3.595	3.420	2.542
70–79	5.419	3.099	6.494	2.600	4.916	4.652	3.436
80–89	7.074	4.038	8.496	3.368	6.442	6.074	4.464
90+	8.950	5.102	10.765	4.235	8.174	7.685	5.627

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3.6 PLOT VOLUME

Volume of each enumerated tree in a plot when added up provided the plot volume These plot volume figures were the basis for estimation of sampling error

3.7 ANALYSIS OF GROWING STOCK

Analysis of growing stock was carried out from plot data and per hectare figures worked out for each stratum by species and diameter class

Following were the important tables generated for each stratum

1 Stems/ha for individual species and its distribution into diameter classes as 10-19 cm , 20-29 cm , 30-39 cm etc
2 Total stems by species and diameter classes
3 Corresponding volume / ha by species and diameter classes
4 Total volume by species and diameter classes

3.8 ERROR

Statistical inference is incomplete without information on associated errors Hence, error has been calculated for every stratum The acceptable error is in the range of ± 10% at state level

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CHAPTER- IV
RESULTS OF INVENTORY

4.0 GENERAL

Data collected during field inventory were analyzed and various Informations were generated Important and relevant extracts from these tables are presented in this chapter Plot data analysis has also been carried out on various parameters In this chapter, inventory data has been analyzed at the district level and separately for each stratum

4.1 FOREST COVER AS PER STATE OF FOREST REPORT 1997(F.S.I)

The extent of forest cover of the entire undivided Singhbhum district is given below

District	Geographical area(sq km)	Forest cover (sq km.)			
		Dense	Open	Mangrove	Total
Singhbhum	13440	3013	1545	-	4558

Source . State of Forest Report, F.S.I. publication 1997.

4.1.1 RECORDED FOREST AREA

The forest area of Singhbhum district by legal status as recorded in the Annual Administration Report for the period 1989-90 to 1992-93, published from Forest Research Division, Bihar is tabulated below

Legal status	Recorded forest area (ha)
1 Reserved forest	250719
2 Protected forest	195340
3 Unclassed forest	252
Total :	**446311**

The difference in the above mentioned figures for total forest area arises due to the difference in the source of information as well as the year of determination

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4.1.2 INVENTORIED AREA

The extent of forest area as represented by 449 plots, marked on the green wash area of the toposheets of Singhbhum district was calculated using 'dot grid' method The total area comes out to be 4438.31 sq.km Henceforth, the inventoried forest area i.e 4438 31 sq. km as calculated by 'dot grid' method would be taken as the total forest area of the district

4.2 STRATIFICATION

Stratification was based on proportional distribution of the forest area as per their composition and nature of the crop of origin These are high forest, coppice forest and plantation forest stratum respectively. The high forest stratum is composed of Sal (Shorea robusta) as the main species, which has got natural regeneration from the seed origin The plantation stratum comprises of artificially regenerated areas only In coppice stratum, the nature of regeneration is of coppice origin

4.3 ANALYSIS OF PLOT DESCRIPTION DATA

The plot description data was analyzed on various parameters characterising the plots e g soil, terrain condition, regeneration status; grazing incidence, fire incidence, plantation potentiality etc and the required information was generated The results of the same are summarized as follows

4 3 1 DISTRIBUTION OF FOREST AREA BY LAND USE CLASSES :

Code No	Land use	Description	No of plots	Forest area(ha.)	Percentage
1	Dense tree forest	Forest with canopy density 70% and above	52	51401	11.58
2	Moderately dense tree forest	Forest with canopy density 30% to 69%	184	181882	40.98
3	Open tree forest	Forest with canopy density 5% to 29%	87	85998	19.38
4	Scrub forest	Forest with canopy density less than 5%	35	34598	7.80
5	Bamboo brakes	Areas completely covered with bamboo	-	-	-
6	Shifting cultivation	Areas under current as well as previous years shifting cultivation	15	14828	3.34
7	Young plantations of forestry species		21	20758	4.68
8 to 10	Trees in line	Trees along forest road, canal banks, rly lines and Govt.grass land etc.	1	988	0.22
11	Barren land	-	2	1977	0.45
12	Agriculture land without trees	-	19	18781	4.23
13	Agricultural land with trees	-	7	6919	1.56
14	Non forestry plantation	-	-	-	-
15	Habitation	-	5	4943	1.11
16	Water bodies	-	1	988	0.22
18	Young crop of natural or artificial regeneration	-	20	19770	4.45
		Total	449	443831	100.00

The above table reveals that 52.56% of the total forest is covered under dense and moderately dense forest(density above 30%) About 19 38% of the forest area is under open forest (density between 5-29%) In all 88 87% of forest land is under vegetation, including scrub and bamboo forest, and the rest is being used for non-forestry purposes The major factor responsible for diversion of forest land to non-forestry purposes is agricultural use, which accounts for 10 24% of the forest land, mainly due to shifting cultivation, habitation, encroachment of forest land for agricultural use and habitation. Out of 88.87% of the vegetated land, about 7 8% of the area is covered by scrub forest consisting of inferior tree growth with less than 5% canopy density

Contents

4.3.2 TREE FOREST AREA FOR GROWING STOCK ESTIMATION

The area falling under landuse classes of dense tree forest, moderately dense tree forest, open tree forest, young plantations of forestry species and young crop of natural or artificial regeneration were considered as tree forest area and was taken for growing stock estimation. Thus, the total tree forest area for growing stock estimation is 3598.09 sq km

The entire tree forest area can be classified into three strata namely high forest, coppice forest and plantation forest as stated in para 4.2. The tree forest area falling under each stratum are as under

Stratum	No of plots	Tree forest area(ha)
High forest	216	213513
Coppice forest	127	125538
Plantation forest	21	20758
Total	364	359809

It is worthwhile to mention that 1 plot represents 988 488 ha forest area

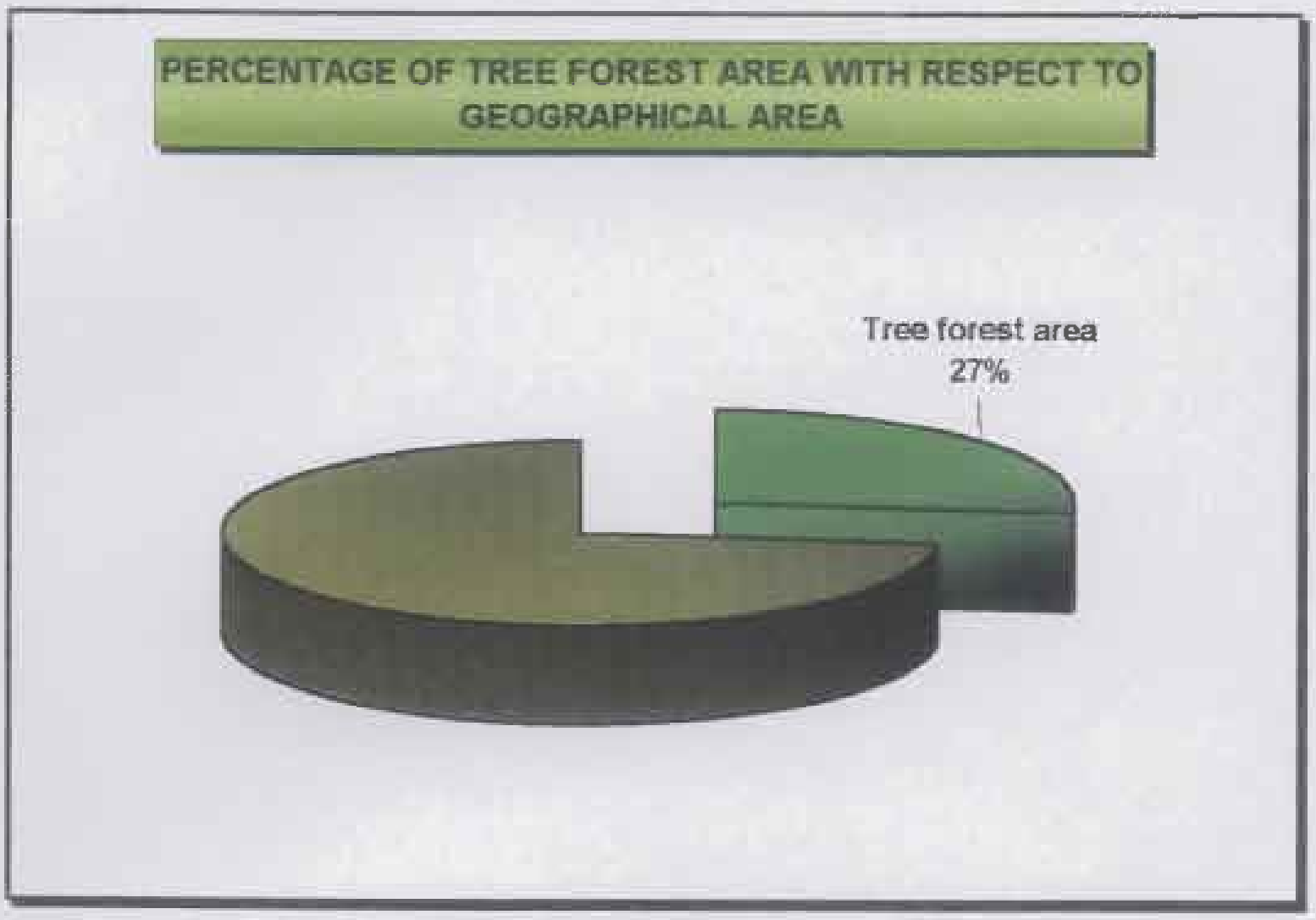
4.3.3 DISTRIBUTION OF TREE FOREST AREA BY TOPOGRAPHY

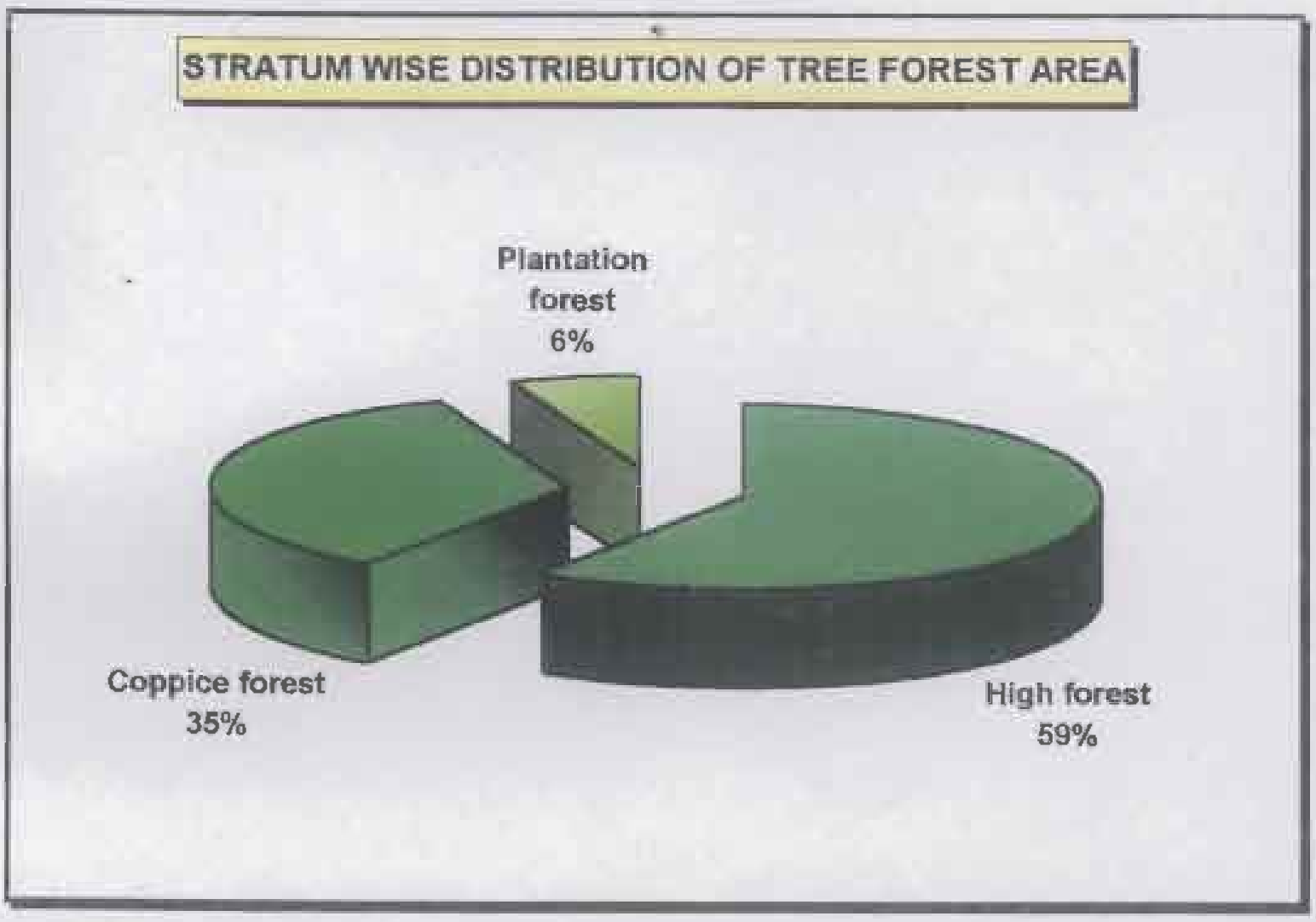
Distribution of tree forest area of the district by topography is given below -

Code	Topography	No.of plots	Area in ha	Percentage
1	Flat	17	26689	7.42
2	Gently rolling	54	53378	14 83
3	Hilly	270	266892	74 18
4	Very hilly	13	12850	3 57
	Unrecorded	-	-	-
	Total	**364**	**359809**	**100.00**

Most of the forests in Singhbhum district are having hilly or gently rolling topography with 74 18% and 14 83 % forest area respectively Very hilly forest occupies 3 57%

Contents


PERCENTAGE OF TREE FOREST AREA WITH RESPECT TO GEOGRAPHICAL AREA
Tree forest area
27%


STRATUM WISE DISTRIBUTION OF TREE FOREST AREA
Plantation forest
6%
Coppice forest
35%
High forest
59%

4.3.4 DISTRIBUTION OF TREE FOREST AREA BY ASPECT

The distribution of the tree forest area by various aspect is summarized below -

Code	Aspect	No.of plots	Forestarea (ha.)	Percentage
1	Northern	37	36574	10 16
2	North-eastern	52	51401	14 29
3	Eastern	33	32620	9 07
4	South-eastern	46	45470	12 64
5	Southern	40	39540	10 99
6	South-western	44	43493	12 09
7	Western	24	23724	6.59
8	North-western	55	54367	15 11
9	No aspect	33	32620	9 06
	Unrecorded	-	-	-
	Total:	**364**	**359809**	**100.00**

Forest area of the district is distributed in all the aspect classes. Forest area is mostly in North-western aspect followed by forest area having north-eastern aspect at 15 11% and 14 29% respectively. Forest area having no aspect constitute 9 06%

4.3.5 DISTRIBUTION OF FOREST AREA BY ROCKINESS

The tree forest area by rockiness classes is as under

Code	Rockiness	No of plots	Forest area in ha.	Percentage
1	High	1	988	0 27
2	Medium	28	27678	7 69
3	Low	102	100826	28 02
4	No rock	231	228340	63 47
	Unrecorded	2	1977	0 55
	Total:	**364**	**359809**	**100 00**

Rockiness refers to the degree of presence of rock covering the land surface in 2 ha area around the plot centre The above table indicates that rock is absent in 63 47% of the area and the surface is available for tree growth However, low rockiness (less than 30% area covered by rock) is observed in 28 02% of the area

Contents

4.3.6 DISTRIBUTION OF TREE FOREST AREA BY SOIL CONSISTENCY

Soil of the district is found to be under the following categories

Code	Soil consistency	No.of plots	Forest area in ha	Percentage
1	Friable	5	4942	1.37
2	Slightly compact	356	351902	97 81
3	Compact	3	2965	0.82
4	Cemented	-	-	-
5	No soil	-	-	-
	Unrecorded	-	-	-
	Total	**364**	**359809**	**100.00**

Soil consistency represents the nature of soil material that is expressed by the degree and kind of cohesion or resistance to deformation or rupture. It is observed from the above table that slightly compact soil i e soil which sticks together as a lump when taken in hand, covers 97 81% of the tree forest area

4.3.7 DISTRIBUTION OF TREE FOREST AREA BY SOIL TEXTURE

Texture of soil refers to relative occurrence of clay, silt and sand particles The following table indicates the soil texture classification

Code	Soil texture	No. of plots	Forest area (in ha)	Percentage
1	Clayey	1	988	0.27
2	Clayey loam	65	64252	17.86
3	Loam	263	259972	72.25
4	Sandy loam	35	34597	9.62
5	Sandy	-	-	-
6	No soil	-	-	-
	Unrecorded	-	-	-
	Total	**364**	**359809**	**100 00**

A high percentage i e 72 25% of the total tree forest area has a loamy texture i e soil having mostly silt and sand with some clay followed by clayey loam i.e 17 86% and 9 62% having sandy loam texture

4 3 8 DISTRIBUTION OF TREE FOREST AREA BY SOIL EROSION :

The extent of erosion in the district is given below

Code	Soil erosion	No of plots	Forest area in ha	Percentage
1	Heavy erosion	54	53378	14 84
2	Moderate erosion	94	92918	25 82
3	Mild erosion	169	167055	46 43
4	No erosion	46	45470	12.64
	Unrecorded	1	988	0 27
	Total	**364**	**359809**	**100 00**

Erosion means the wearing away of the earth's surface by the forces of water and wind 46 43% of the tree forest area is marked as mild erosion (less than 25% of top soil appears to be washed away) areas followed by 25 82% as moderate erosion areas (25 to 75% of top soil appears to be washed away). More than 75% top soil removed i e heavy erosion appears in 14 84% area

4 3.9 DISTRIBUTION OF TREE FOREST AREA BY INJURIES TO CROP

Injuries to crop as observed during inventory are as under

Code No	Details	No.of plots	Forest area in ha	Percentage
1	Borer attack leaf defoliater attack or damage By other pest epidemic	1	988	0.27
2	Top drying	1	988	0.27
3	Girdling and illicit felling	313	309397	86.00
4	Scarring of trees	-	-	-
5	Lopping for fodder	1	988	0.27
6	Wind damage and flood damage	-	-	-
7	Other injuries	-	-	-
8	No injuries	44	43494	12.09
	Unrecorded	4	3954	1.10
	Total	**364**	**359809**	**100 00**

Contents

Injury to the crop was judged by ocular estimation in a two hectare area around the centre of the plot, provided the affected trees formed at least 10% of the crop. The above table indicates that 86% of the tree forest area is affected by girdling and illicit felling Injury to crop is absent in 12 09% area Thus, the above table reveals that illicit felling is still the major source of injury to crop.

4.3.10 DISTRIBUTION OF TREE FOREST AREA BY FIRE INCIDENCE

Tree forest area as affected by fire incidence is given below

Code	Item	No.of plots	Forest area in ha.	Percentage
1	Heavy	1	988	0 27
2	Moderate	60	59309	16 48
3	Light	192	189790	52 75
4	No fire	107	105768	29 40
	Unrecorded	4	3954	1 10
	Total:	**364**	**359809**	**100.00**

Practically no incidence of heavy fire was observed in the tree forest area However, 'light'fire incidence was assessed over 52 75% of total tree forest area, followed by 'moderate' fire incidence in 16.48% area

4.3.11 DISTRIBUTION OF TREE FOREST AREA BY GRAZING INCIDENCE

Tree forest area as affected by grazing incidence is as under

Code No	Item	No of plots	Forest area in ha.	Percentage
1	Heavy grazing	42	41516	11.54
2	Moderate grazing	130	128503	35 71
3	Light grazing	124	122573	34 07
4	No grazing	64	63263	17 58
	Unrecorded	4	3954	1 10
	Total :	**364**	**359809**	**100 00**

'Heavy' and regular grazing causing absence of grass on the ground, damaging regeneration and causing 50 to 75% of ground cover to be lost was seen in 11 54% of the tree forest area 35 71% of the total tree forest area suffers from 'moderate' grazing followed by light grazing in 34 07% of tree forest area

4.3.12 DISTRIBUTION OF TREE FOREST AREA BY PLANTATION POTENTIALITY

Plantation potentiality of the inventoried area can be judged by the following table·

Code No	Plantation potentiality	No of plots	Forest area in ha	Percentage
1	Plantable	81	80067	22 25
2	Unplantable	4	3954	1 10
3	Not applicable	276	272823	75 83
	Unrecorded	3	2965	0 82
	Total:	**364**	**359809**	**100.00**

Plantation potentiality in the tree forest area of the undivided Singhbhum district is 22 25% and this forest area is suitable for raising artificial forests with suitable species Plantation is not required in 75 83% of the tree forest area as evident from the above table

4.3.13 DISTRIBUTION OF TREE FOREST AREA BY INTENSITY OF REGENERATION:

Distribution of regeneration status is given in the following table

Code No.	Description (No.of seedlings in 4m x 4m square plot)	No.of plots	Forest area (in ha)	Percentage
1	Adequate(8 or more)	54	53378	14 84
2	Inadequate(less than 8 seedlings)	224	221421	61 54
3	Absent(no seedlings)	79	78091	21 70
	Unrecorded	7	6919	1 92
	Total:	**364**	**359809**	**100 00**

Contents

Only 14 84% of the tree forest area is having adequate regeneration where as inadequate regeneration is observed in 61 54% of the area. Regeneration is absent in 21.70% of the tree forest area.

4.3.14 DISTRIBUTION OF TREE FOREST AREA BY DEGRADATION

Following table shows the degradation status of the inventoried area

Code No.	Degraded status	No of plots	Forest area in ha	Percentage
I	Grazing,fire pollarding illicit cutting, lopping			
11	Heavily degraded	74	73148	20 33
12	Moderately degraded	145	143331	39 84
13	Mildly degraded	105	103791	28 85
14	Not degraded	39	38551	10.71
II	Other natural calamity such as landslide, glaciers,rainfall etc	-	-	-
21	Heavily degraded	-	-	-
22	Moderately degraded	-	-	-
23	Mildly degraded	-	-	-
24	Not degraded	-	-	-
	Unrecorded	1	988	0 27
	Total:	**364**	**359809**	**100.00**

The survey reveals that majority of the tree forest area is subjected to moderate degradation or mild degradation, which constitute 39 84% and 28.85% of the tree forest area respectively. Heavy degradation constitutes 20.33%. Area not affected by any degradation is 10 71% only

4.4 TREE DENSITY STUDY

The forests of Singhbhum district have been classified into three strata as already indicated in Para No 4 3 2 The distribution of stems/ha , total number of stems, total volume and volume/ha falling in each stratum have been calculated for various species with regard to their occurrence in each diameter class which are described below in detail

The distribution of stems/ha by species and diameter classes in different strata have been calculated which are given in tables No 1.1 to 1 3 (vide part II of this report). The stems/ha.in different strata is summarized below

Sl.No.	Stratum	No. of stems/ha.
1	High forest	265.554
2	Coppice forest	168.267
3	Plantation forest	39.524
	Total for the district	218 570

Thus, the average stems/ha. for all the 3 strata i e tree forest area of the district is estimated to be 218 57

4.4.1 TREE DENSITY – HIGH FOREST STRATUM·

Table No 1 1 shows the distribution of stems/ha in each diameter class for the individual species found in this stratum which has an area of 213513 ha. The following observations can be made for this stratum on the basis of the above table

i) The number of stems/ha in this stratum is 265 554
ii) Concentration of trees in the lower diameter classes i e 10-19cm is maximum, which accounts 68 06% of the total trees of this stratum, followed by 18 92% and 7 98% in 20-29cm.and 30-39cm.diameter classes respectively.
iii) It is also observed that 5.05% of the trees are above 30cm diameter classes.
iv) The values for the stems/ha with percentage for some of the dominant species are summarized below·

Species	No of stems/ha	Percentage
Shorea robusta	102 592	38 63
Buchanania lanzan	15 787	5 94
Terminalia crenulata	19 861	7 48
Anogeissus latifolia	18 750	7 06
Lannea coromandelica	9 259	3 49

4.4.2 TREE DENSITY,COPPICE FOREST STRATUM :

Table No 1 2 shows the distribution of stems/ha of various species by their diameter classes found in this stratum which has an area of 125538 ha. The salient features of this stratum are furnished below

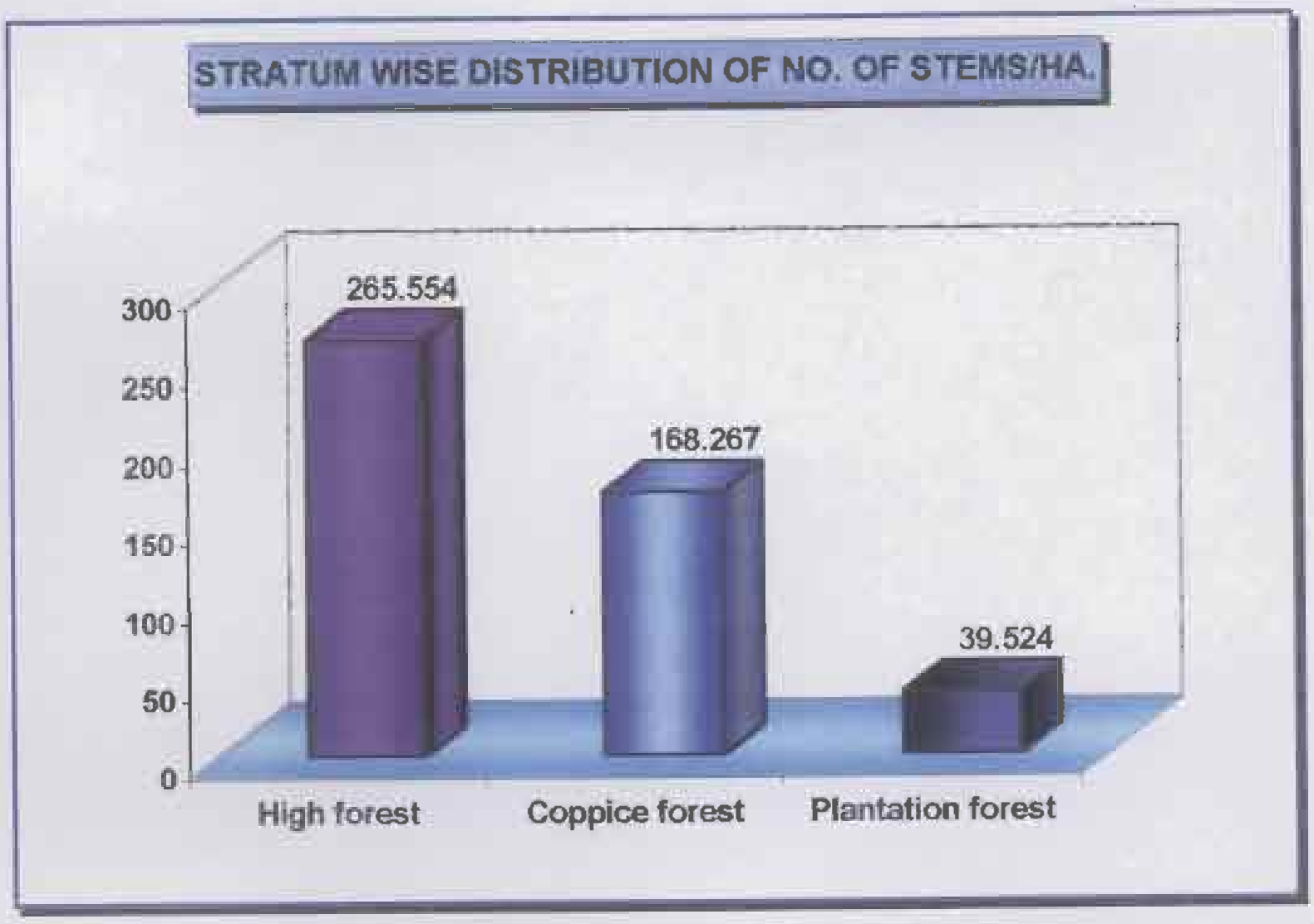
i) The number of stems /ha is 168 267 in this stratum
ii) Like other stratum, concentration of trees in the lower diameter class i e 10-19cm is maximum, which accounts for 79 88% followed by 13 25% and 4 49% of the total number of trees in 20-29cm and 30-39cm diameter classes respectively
iii) Trees having diameter over 40cm. constitute 2 38% of the total trees
iv) The number of stems/ha with percentage for some of the dominant species are furnished below

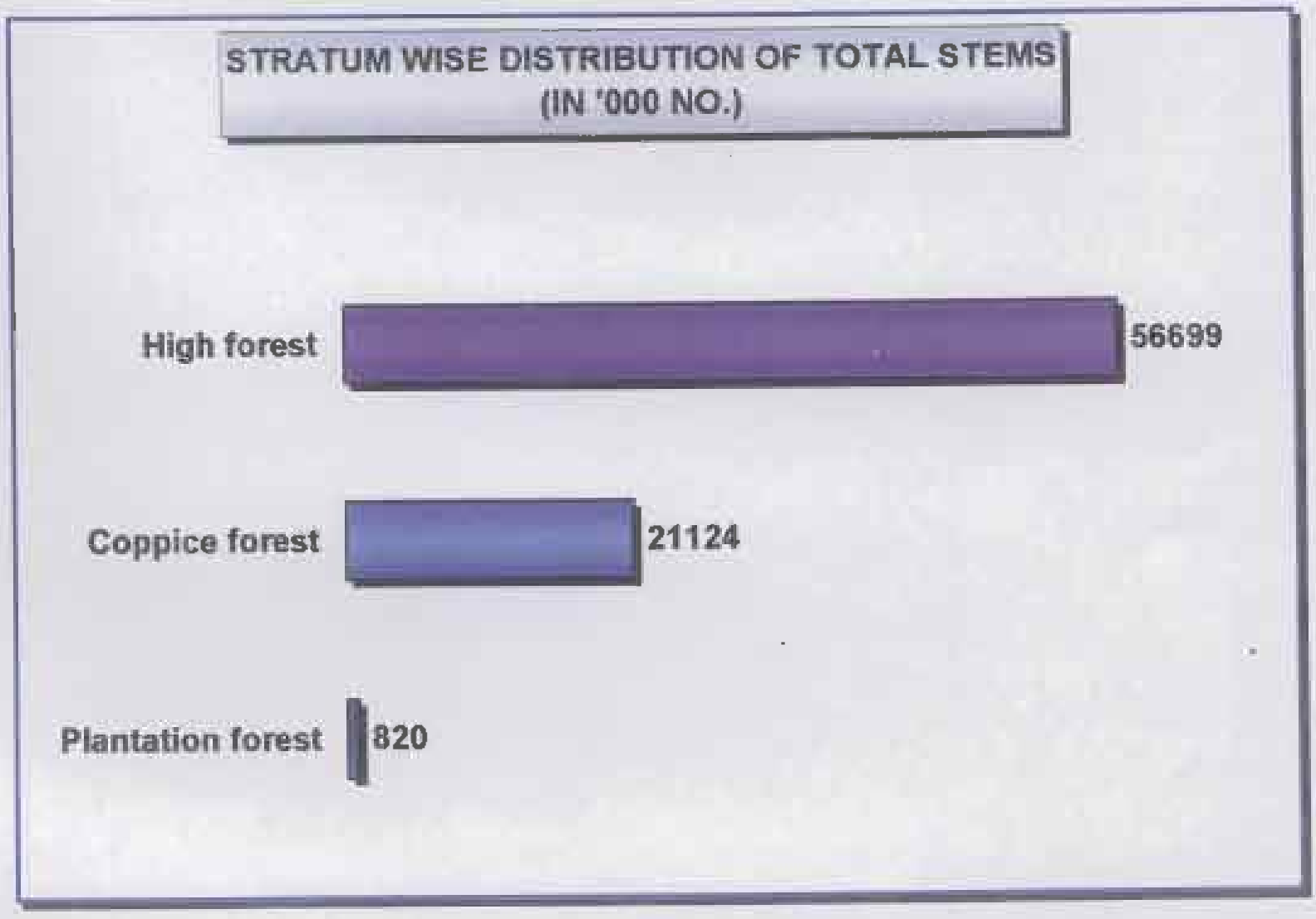
Species	No. of stems/ha.	Percentage(%)
Shorea robusta	67 401	40 06
Buchanania lanzan	17 874	10 62
Terminalia crenulata	10 709	6 36
Anogeissus latifolia	10 157	6 04
Diospyros melanoxylon	6 693	3 98

4.4.3 TREE DENSITY- PLANTATION FOREST STRATUM

Table no.1 3 gives the distribution of stems/ha of various species by their diameter classes found in this stratum, which has an area of 20758 ha The following observations can be made for this stratum from the above mentioned table of this report

Contents


STRATUM WISE DISTRIBUTION OF NO. OF STEMS/HA.
300
250
200
150
100
50
0
265.554
168.267
39.524
High forest
Coppice forest
Plantation forest


STRATUM WISE DISTRIBUTION OF TOTAL STEMS
(IN '000 NO.)
High forest
56699
Coppice forest
21124
Plantation forest
820

Contents

i) Number of stems/ha is 39 524

ii) Trees are present in all classes up to 70cm diameter class but the bulk of the trees are present in 10-19cm.diameter class amounting to 77 11% followed by 7 23% and 8 43% of the total trees in 20-29cm and 30-39cm diameter classes respectively

iii) Trees beyond 50cm Diameter class are 4 81% of the total trees

iv) Dominant species with number of stems/ha and percentage distribution are as follows

Species	Stems/ha	Percentage
Tectona grandis	10 000	25 30
Anacardium occidentale	6 190	15 66
Bridelia retusa	4 762	12 05
Madhuca latifolia	3 333	8 43
Grewia microcos	2 857	7.23

4.5 TOTAL STEMS :

Total number of stems by species and diameter classes in different strata are given in table No 2 1 to 2 3 (vide part II of this report) Total number of stems by stratum are summarized below .

Stratum	Total stems (in '000 no.)
High forest	56699
Coppice forest	21124
Plantation forest	820
Total:	**78643**

Thus, total number of stems in the forests of Singhbhum district has been estimated as 78 64 million

Total number of stems of some of the dominant species in different stratum are appended below .

Contents

a) Stratum – High forest :

Species	Total Stems(In '000 no)
Shorea robusta	21905
Anogelssus latifolia	4003
Terminalia crenulata	4241
Buchanania lanzon	3371
Lannea coromandelica	1977

b) Stratum : Coppice forest.

Species	Total Stems(in '000 no)
Shorea robusta	8461
Anogeissus latifolia	1275
Terminalia crenulata	1344
Buchanania lanzon	2244
Diospyros melanoxylon	840

c) Stratum . Plantation forest :

Species	Total Stems(in '000 no.)
Tectona grandis	208
Anacardium accidentale	128
Bridelia retusa	99
Madhuca latifolia	69
Grewia microcos	59

4 6 VOLUME STUDIES

Distribution of volume per hectare has been estimated separately for each stratum in respect of tree forest area i e over an area of 359809 ha These are included as Table No.3 1 to 3.3 in Part II of this report

The abstract of volume/ha. by stratum is given below along with the over all position of volume/ha of the tree forest areas combined for the district

Contents

Sl No.	Stratum	Volume/ha (in m^3)
1	High forest	56.824
2	Coppice forest	25 917
3	Plantation forest	12 109
	Total for the district	**43.461**

The overall average volume/ha is 43.461 m^3 for tree forest area of the district irrespective of stratum corresponding to 218 570 number of stems/ha.

4 6.1 STRATUM WISE VOLUME ANALYSIS – HIGH FOREST STRATUM

Table No 3 1 gives a composite picture of volume/ha in this stratum with distribution of volume by species in various diameter classes The following observations may be drawn from the table indicated.-

i) Volume/ha is 56 824 m^3
ii) Shorea robusta contributes a major portion of the volume which accounts for 43.07% of all trees. This species is found to be present in almost all the diameter classes.
iii) Satisfactory volumetric representation is observed up to 50cm diameter classes to the tune of 23 64%, 24 92%,22 46% and 18 89% in 10-19,20-29,30-39 and 40-49cm diameter classes respectively
iv) Volume/ha with percentage for some of the volume contributing species are given below

Species	Volume/ha (m^3)	Percentage(%)
Shorea robusta	24 476	43 07
Anogeissus latifolia	5 648	9 94
Terminalia crenulata	4 473	7 87
Adina cordifolia	1 857	3 27
Buchanania lanzan	1 872	3.29

4 6 2 STRATUM WISE VOLUME ANALYSIS – COPPICE FOREST STRATUM

The distribution of volume/ha by species and diameter classes in this stratum has been given in table No 3 2 (vide part II of this report) The salient observations are as under -

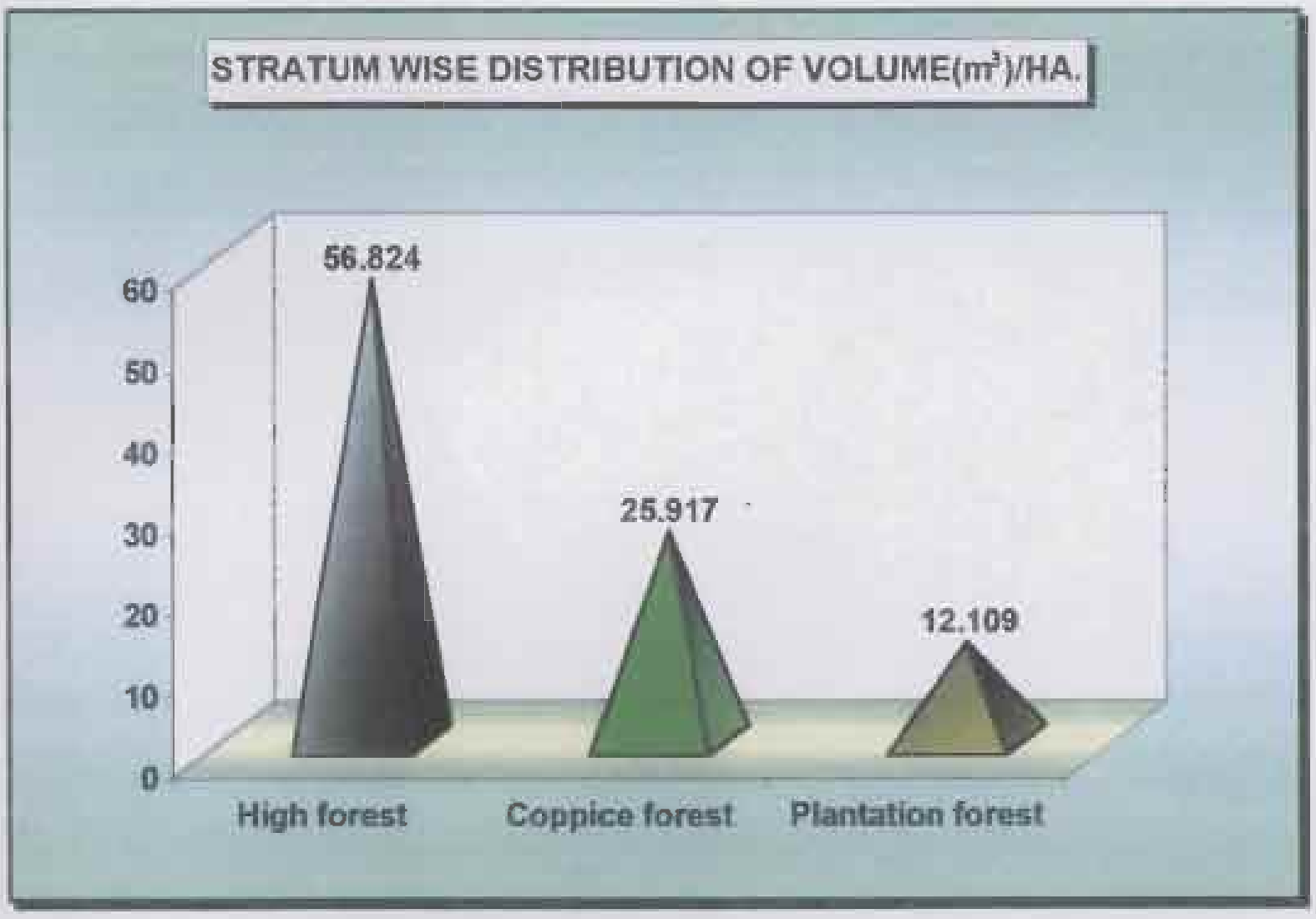
i) Volume/ha is 25 917 m^3
ii) Volume is concentrated mostly in 10-19cm diameter class, which accounts 36.70% of the volume contribution of this stratum followed by 23.74%, 16 19%, 11.88% in 20-29cm , 30-39 cm and 40-49cm diameter classes respectively.
iii) Volume/ha with percentage for some of the major volume contributing species are given below :

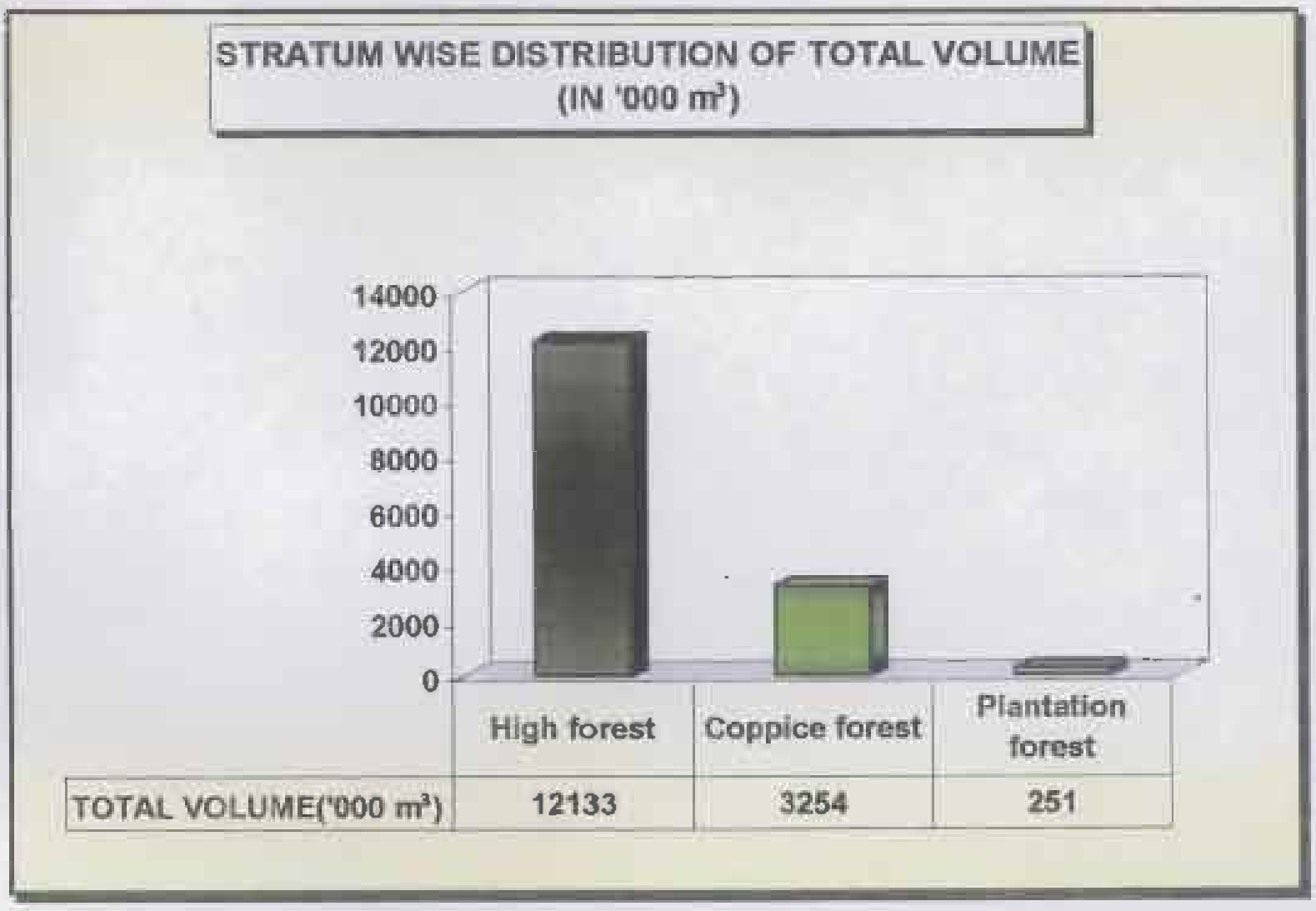
Species	Volume/ha (m^3)	Percentage(%)
Shorea robusta	9 008	34 76
Anogeissus latifolia	2 017	7 78
Terminalia crenulata	1 535	5 92
Madhuca latifolia	1 480	5 71
Diospyros melanoxylon	1 429	5.51
Buchanania lanzan	2 177	8 40

4.6.3 STRATUM WISE VOLUME ANALYSIS – PLANTATION FOREST STRATUM

The following observation can be made from the table no 3 3(vide part II of this report)

i) Volume/ha. is only 12.109 m^3
ii) Trees are found to be evenly distributed upto 60-69cm diameter classes and are not concentrated in a particular diameter class Trees are also found to contribute substantial volume even in 80-89cm diameter class which accounts 32 59% of the total volume of this stratum
iii) Volume / ha with percentage for some of the volume contributing species are furnished below .


STRATUM WISE DISTRIBUTION OF VOLUME(m³)/HA.
56.824
25.917
12.109
60
50
40
30
20
10
0
High forest
Coppice forest
Plantation forest


STRATUM WISE DISTRIBUTION OF TOTAL VOLUME
(IN '000 m³)
14000
12000
10000
8000
6000
4000
2000
0
High forest
Coppice forest
Plantation forest
TOTAL VOLUME('000 m³)
12133
3254
251

Species	Volume/ha.(m³)	Percentage(%)
Ficus bengalensis	1 898	15 67
Anacardium occidentale	0 921	7 61
Terminalia chebula	0 677	5 59
Madhuca latifolia	4 988	41 19
Diospyros melanoxylon	1.488	12.29
Tectona grandis	0 550	4 54

It is interesting to note that Tectona grandis has highest number of stems, but its volumetric representation is less, as is evident from the above table because of its confinement mainly to lower diameter classes

4 7 TOTAL VOLUME :

Total volume by species and diameter classes in different strata have been estimated and furnished in table 4 1 to 4 3 which are appended in the part II of this report Total volume by stratum is furnished below

Sl.No.	Stratum	Total Volume(in '000 m³)
1	High forest	12133
2	Coppice forest	3254
3	Plantation forest	251
	Total	15638

Thus, the total growing stock in Singhbhum district is estimated as 15 638 million m³ The contribution of some of the dominant species in different stratum is appended below .

a) High forest Stratum:

Species	Total volume('000 m³)
Shorea robusta	5226
Anogeissus latifolia	1206
Terminalia crenulata	955
Adina cordifolia	396
Buchanania lanzan	400

Contents

b) Coppice Forest Stratum

Species	Total volume('000 m³)
Shorea robusta	1131
Anogeissus latifolia	253
Terminalia crenulata	193
Madhuca latifolia	186
Buchanania lanzan	273

c) Plantation Forest Stratum :

Species	Total Volume('000 m³)
Ficus bengalensis	39
Anacardium occidentale	19
Terminalia chebula	14
Madhuca latifolia	104
Diospyros melanoxylon	31
Tectona grandis	11

4 8 ESTIMATION OF STANDARD ERROR

The standard error percentage (i e S E %) has been calculated by ratio method of estimation for the growing stock The standard error percentage for different strata is given below

Sl.No.	Stratum	Standard Error %
1	High forest	7 40
2	Coppice forest	9 32
3	Plantation forest	20 12
	District	5 65

Thus, S.E.% for the entire Singhbhum district is estimated at 5.65%.

CHAPTER · V
SUMMARY AND CONCLUSIONS

5.1 SUMMARY :

1 The geographical area of undivided Singhbhum district is 13440 sq km . Area shown in green wash on the Survey of India toposheets has been treated as forest areas for the purpose of this inventory The forest area thus calculated by 'dot grid' method comes out to be 4438.31 sq km., which is 33.02% of the geographical area of the district

2 Out of 4438 31 sq.km forest area, tree forest area which is under dense tree forest, moderately dense tree forest, open tree forest, young plantations of forestry species and young crop of natural or artificial regeneration covers 3598.09 sq km ,which is 81 07% of the total forest area of the district. Growing stock estimation is based on this tree forest area as explained in the report.

3. Out of the total forest area of the district, only 11.58% area is covered with dense tree forest The moderately dense tree forest constitutes 40·98% and the open forest constitutes 19 38% of the total forest area

4 The tree forest areas have been broadly categorized into three classes e g high forest,coppice and plantation forests Thus, three strata have been formed out of 3598.09 sq.km. tree forest area. The area of the high forest stratum is 2135.13 sq.km. ,coppice forest stratum is 1255 38 sq km , and area under plantation forest stratum area is 207.58 sq.km

5 The regeneration status is not satisfactory in the district Adequate regeneration is 14 84% of the total forest area 'Inadequate' to 'absent' regeneration is 83 24% of the total tree forest area.

6 Heavy fire incidence is practically absent in the district Incidence of 'moderate' and 'light' fire occurs in 16.48% and 52 75% of the tree forest area respectively

7 11 54% of the forest area is subjectea to heavy grazing Moderate to light grazing occurs in 69 78% of the total tree forest area

8 Per hectare number of stems and volume(m^3) as estimated in 3 strata are given below -

Sl.No.	Stratum	No.of stems/ha.	Volume(m^3)/ha.
1.	High forest	265.554	56.824
2.	Coppice forest	168.267	25.917
3.	Plantation forest	39.524	12.109
	Total for the district	218.570	43.461

Across all the three strata,the estimated number of stems/ha. is 218.570 and the volume/ha.is 43.461 m^3 for the tree forest area of Singhbhum district.

9. Total number of stems is estimated as 78.64 million and the total growing stock is 15.638 million m^3 in the district.

10. 20.33% of the forest area is heavily degraded in the district. Moderately degraded forest area is 39.84% whereas mildly degraded forest area is 28.85% of the total tree forest area. Area free from degradation is 10.71% in the district.

5.2 COMPARISON WITH PAST SURVEY RESULTS :

Forest Survey of India carried out forest inventory in the undivided Singhbhum district during the year 1983 to 1984 covering the entire forests of the district. The same district was resurveyed during the year 1995-96 in accordance with one of the objectives of F.S.I . to monitor periodically (on a 10 year cycle) the changing situation of land and forest resources and present the data to focus attention on critical aspects for national planning.

The findings from the previous survey were compared with the present inventory with respect to the number of stems per hectare and volume per hectare in different diameter classes and strata.

a) Number of stems/ha by diameter class

i) Stratum High forests

Diameter class in cm	Number of stems/ha surveyed in	
	1983-84	1995-96
10-19	177 509	180 740
20-29	60 159	50 231
30-39	24 295	21 204
40-49	8 248	10 324
50-59	2 264	2 361
60-69	0.553	0 370
70-79	0 252	0 231
80-89	-	0 046
90-99	-	0 046
100+	-	-
Total	273.280	265.554

ii) Stratum Coppice forest

Diameter class in cm.	Number of stems/ha surveyed in	
	1983-84	1995-96
10-19	108 173	134 409
20-29	20.298	22 283
30-39	6.122	7.559
40-49	2 438	3 071
50-59	0.477	0 394
60-69	0.291	0 157
70-79	-	0 079
80-89	-	0 157
90-99	-	0 157
100+	-	-
Total	137 799	168 267

Contents

iii) Stratum Plantation forest

Diameter class in cm	Number of stems/ha surveyed in	
	1983-84	1995-96
10-19	39 750	30 476
20-29	8 500	2 857
30-39	1 000	3 333
40-49	0 500	0 952
50-59	-	0 476
60-69	0 250	0 476
70-79	-	-
80-89	-	0.952
90-99	-	-
100+	-	-
Total	50 000	39 524

From the above comparison a picture of the changing pattern of growing stock in terms of stems/ha over a decade from 1983-84 to 1995-96 may be seen. It may be concluded that the percentage decrease in tree density in terms of stems/ha , is 2.83% and 20.95% in High forest and Plantation forest respectively. Tree density however, increased by 22.11% in coppice forest area. The maximum increase is noticed in 10-19cm. diameter class. The distribution of stems/ha. is more in the present survey than the earlier survey in higher diameter classes. The coppice forest occupies 34.89% of the tree forest area. The above findings also point towards a positive effect of the introduction of joint forest management in the locality. Moreover, two coppice regeneration systems are usually followed. One is the simple coppice system in which the overwood is completely felled, and the other is the 'coppice with standards' system in which a suitable number of tree belonging to original overwood are left unfelled. These two systems are especially suitable when the demand for fire wood and poles are high and thus these systems are found to be suitable over practically all the forests in Bihar, to meet the local demands. The result indicates the suitability of the system in the area

Contents

b) Volume/ha by diameter class

i) High forest stratum

Diameter class in cm	Volume/ha as surveyed in	
	1983-84	1995-96
10-19	19.157	13.435
20-29	18 884	14 161
30-39	15.035	12 763
40-49	8.377	10 734
50-59	3.620	3.596
60-69	1 299	0.890
70-79	0.824	0.800
80-89	-	0 199
90-99	-	0.246
100+	-	-
Total	67.196	56.824

ii) Stratum Coppice forest

Diameter class in cm	Volume/ha as surveyed in	
	1983-84	1995-96
10-19	11.463	9.512
20-29	6.790	6 152
30-39	4.184	4 197
40-49	2.919	3.078
50-59	0 898	0 645
60-69	0.817	0.523
70-79	-	0.259
80-89	-	0.712
90-99	-	0.839
100+	-	-
Total .	27.071	25.917

Contents

iii) Stratum Plantation forest

Diameter class in cm	Volume/ha as surveyed in	
	1983-84	1995-96
10-19	12.164	1 858
20-29	4.820	0 809
30-39	0 964	2 246
40-49	0 836	1 242
50-59	-	0.738
60-69	0 839	1 271
70-79	-	-
80-89	-	3 946
90-99	-	-
100+	-	-
Total .	19.623	12.109

There is a sharp decline in all the strata as far as the volume /ha is concerned during the course of one decade from 1983-84 to 1995-96 The picture is not satisfactory in terms of growing stock as the percentage of decrease in respect of volume /ha is 15 44%, 4 26% and 38.29% in high forests, coppice forests and plantation forests respectively The picture is gloomy particularly in the plantation stratum

Like other parts of India's forest, commercial exploitation and population pressure have caused severe damage to the forests of Singhbhum district. Due to low agricultural production, landlessness and poverty, local people are also dependent on the forest resources for their livelihood Many families are totally dependent on the sale of firewood from the forest of this district. Moreover, there are other external pressures on the forest e g i) urban demand for timber and fuelwood ii) illicit felling of trees, iii) pressure due to demand of natural resource based industries

Degradation of low lying forest areas had severely threatened the livelihood of the villagers, forcing them to think of some drastic measures for conserving this vital resource In 1990, Government of India issued guidelines for facilitating the development of a partnership for forest management between village communities and the Forest Department Under these guidelines, the Forest Department actively encouraged the creation of a number of Village Forest Protection Committees in the villages adjoining degraded forests In turn, these FPC's are allowed certain benefits from the forests and right over forest produce under predefined benefit sharing arrangements between the Forest Department and the FPCs It is expected that the implementation of the participatory forest management program, with active encouragement of the Forest Department can enthuse as well as empower the Village Forest Protection Committees to protect and conserve forest resources so as to improve the quantity and quality of forests in terms of the number of trees and growing stock in the near future

Contents

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3. District Census Hand Book, Singhbhum district 1981 Series 4, Bihar, Parts XIII, A and B, Village and Town Directory, Director of Census Operation, Bihar.
4. Annual Administration Report for the year 1989-90 to 1992-93, Forest Department, Govt.of Bihar, Forest Research Division, Ranchi, Bihar.
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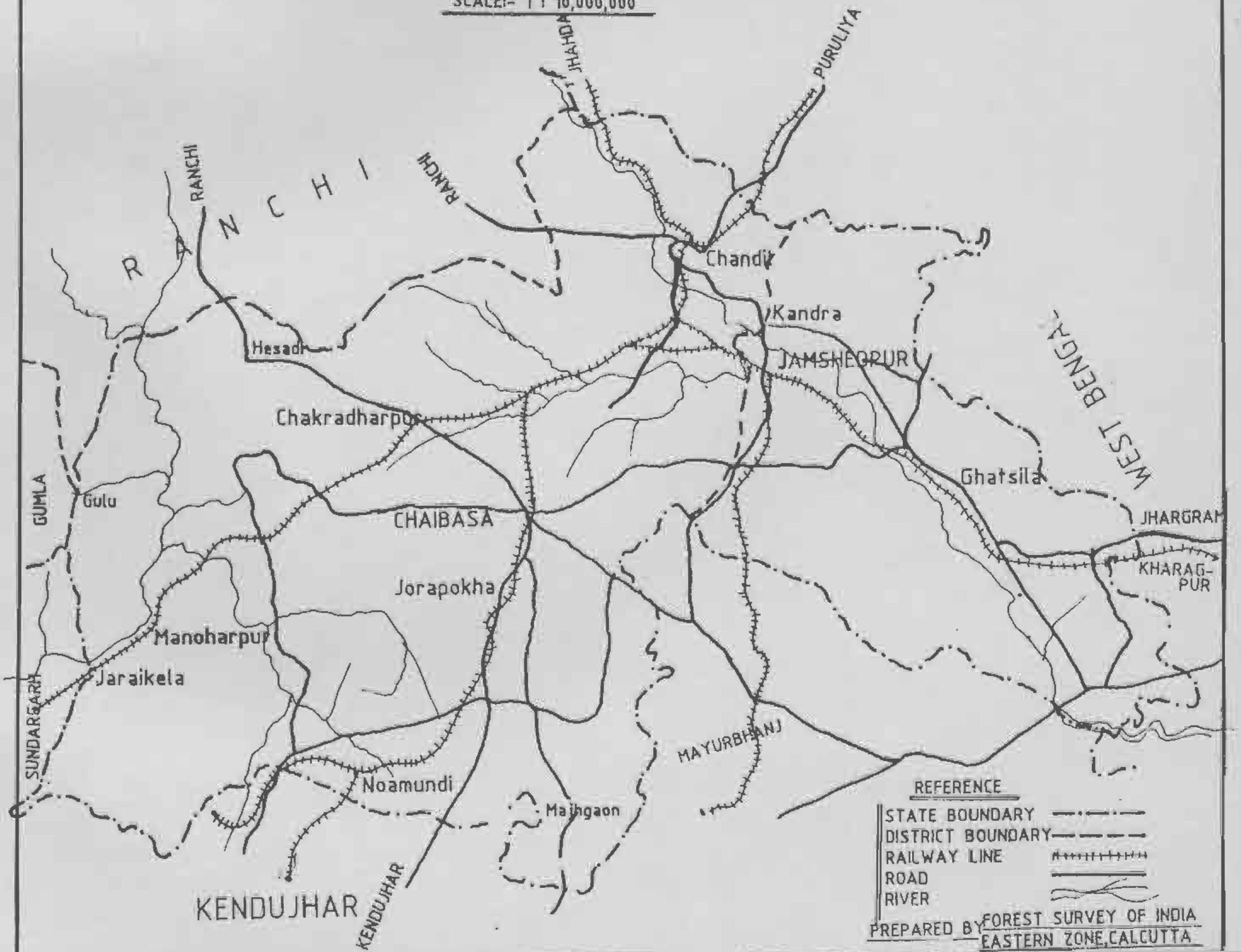
PROJECT MAP OF SINGHBHUM DISTRICT

SCALE:- 1 : 10,000,000



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FOREST SURVEY OF INDIA
INVENTORY DESIGN

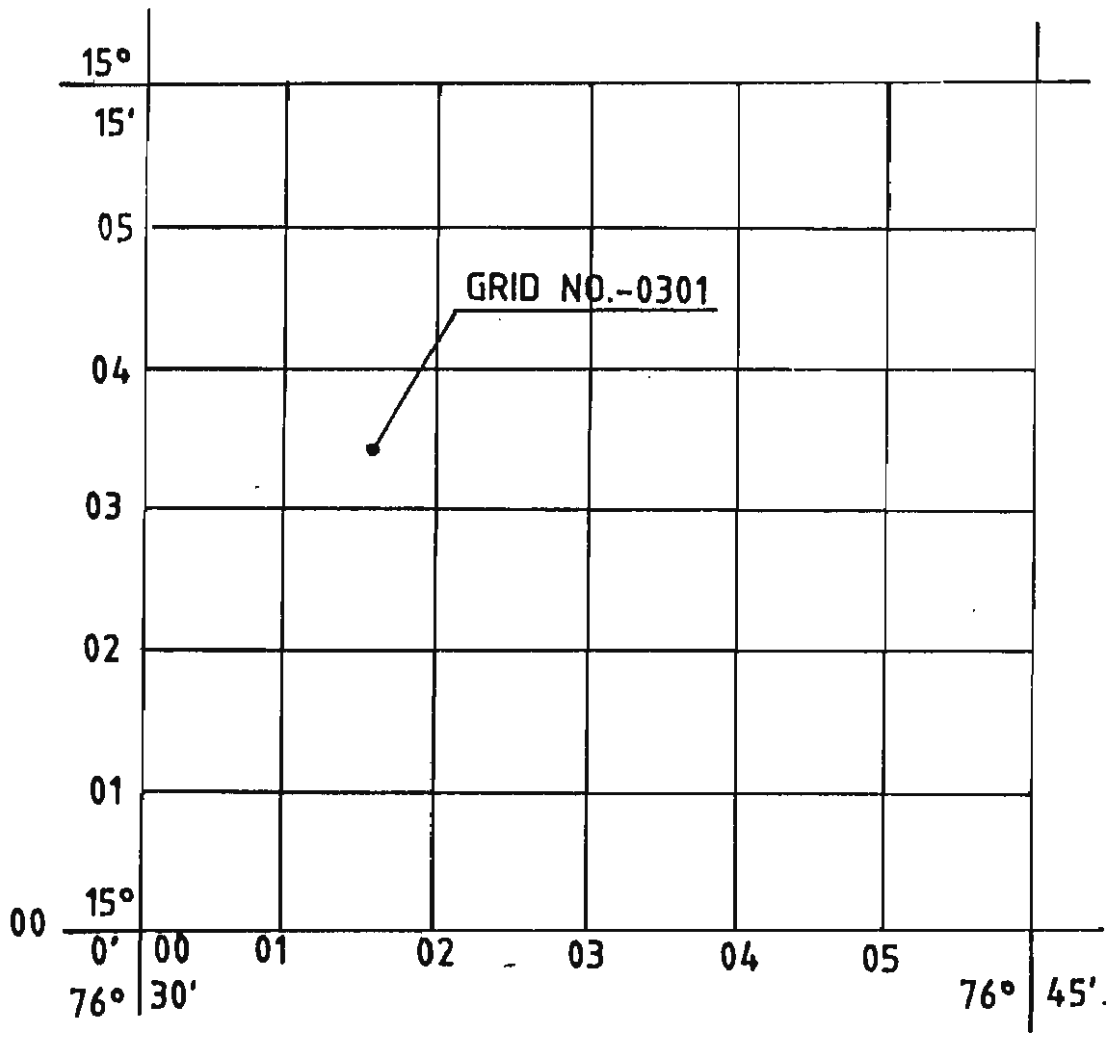
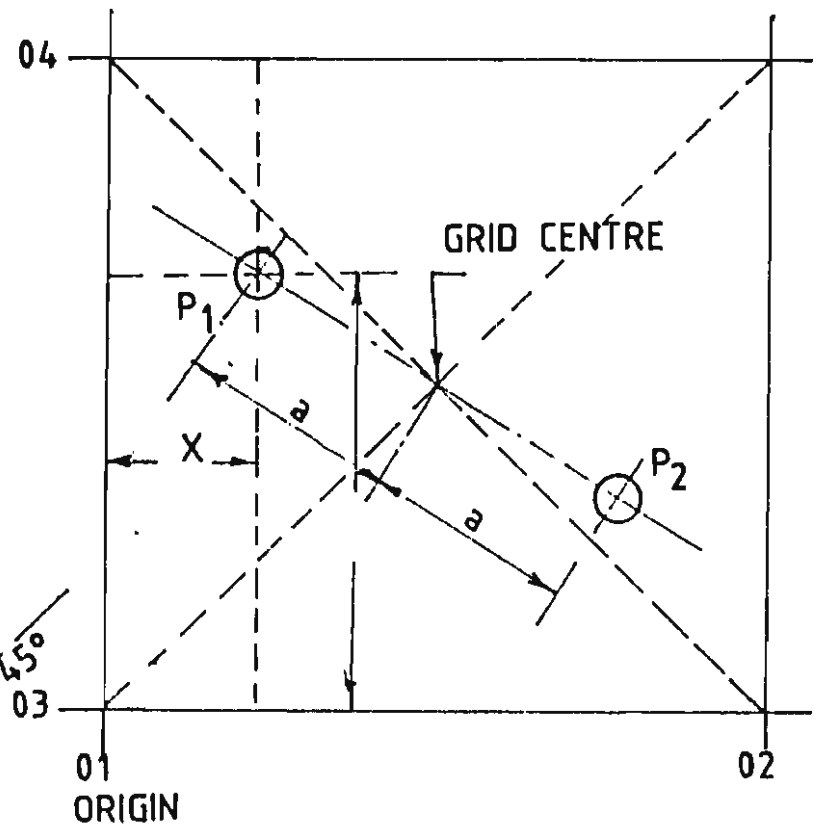


DIAGRAM-1

DIAGRAM SHOWING IDENTIFICATION OF GRIDS ON 1:50,000 OR 1:63,360 SCALE TOPO SHEETS.

DIAGRAM-2

DIAGRAM SHOWING MARKING OF PLOT IN 2 1/2 X 2 1/2 GRID 'X' & 'Y' ARE THE DISTANCES ALONG 'X' & 'Y' AXES WITH S.W. CORNER AS THE ORIGIN.



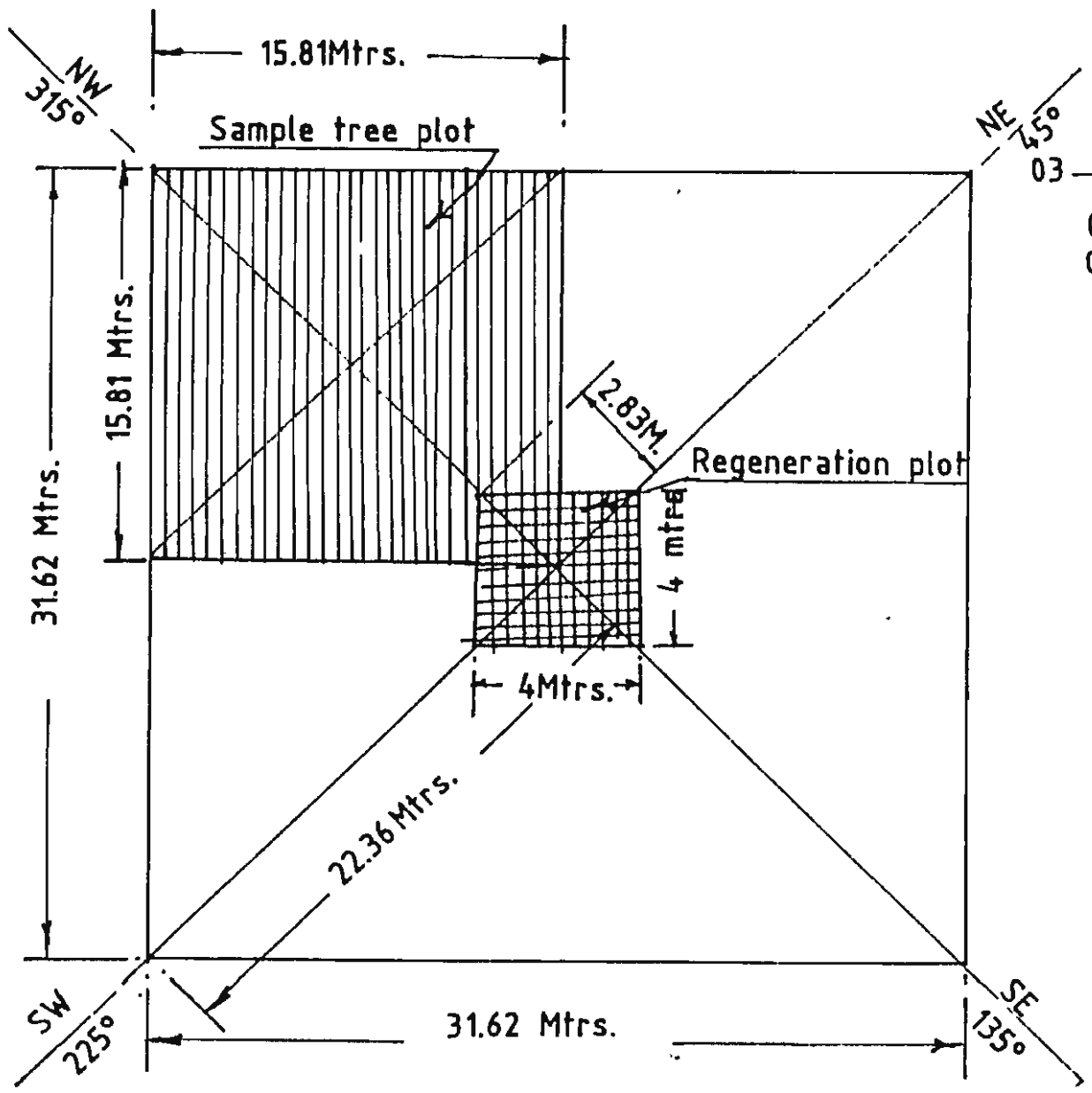


DIAGRAM-3

DIAGRAM SHOWING LAY OUT OF PLOT

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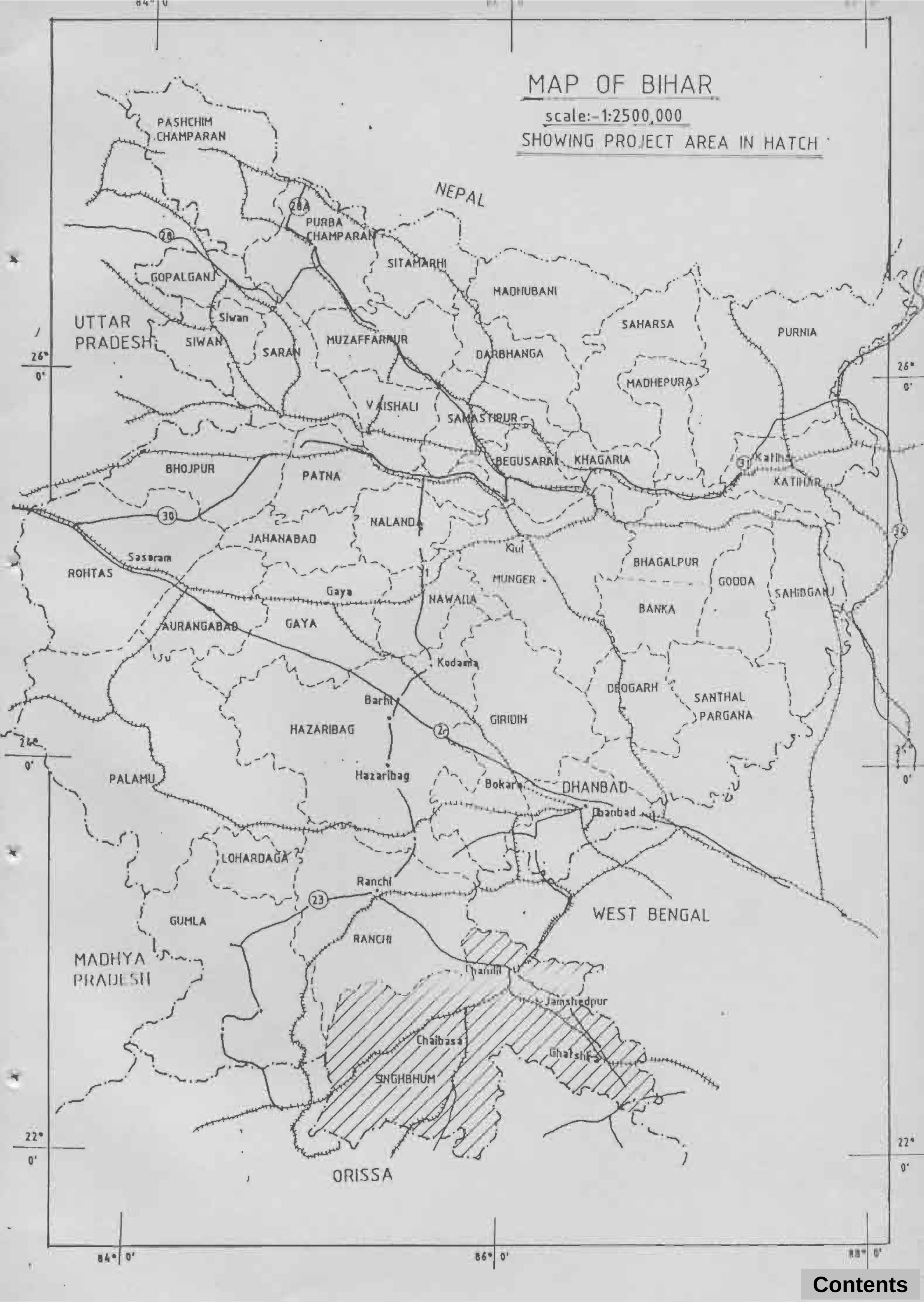
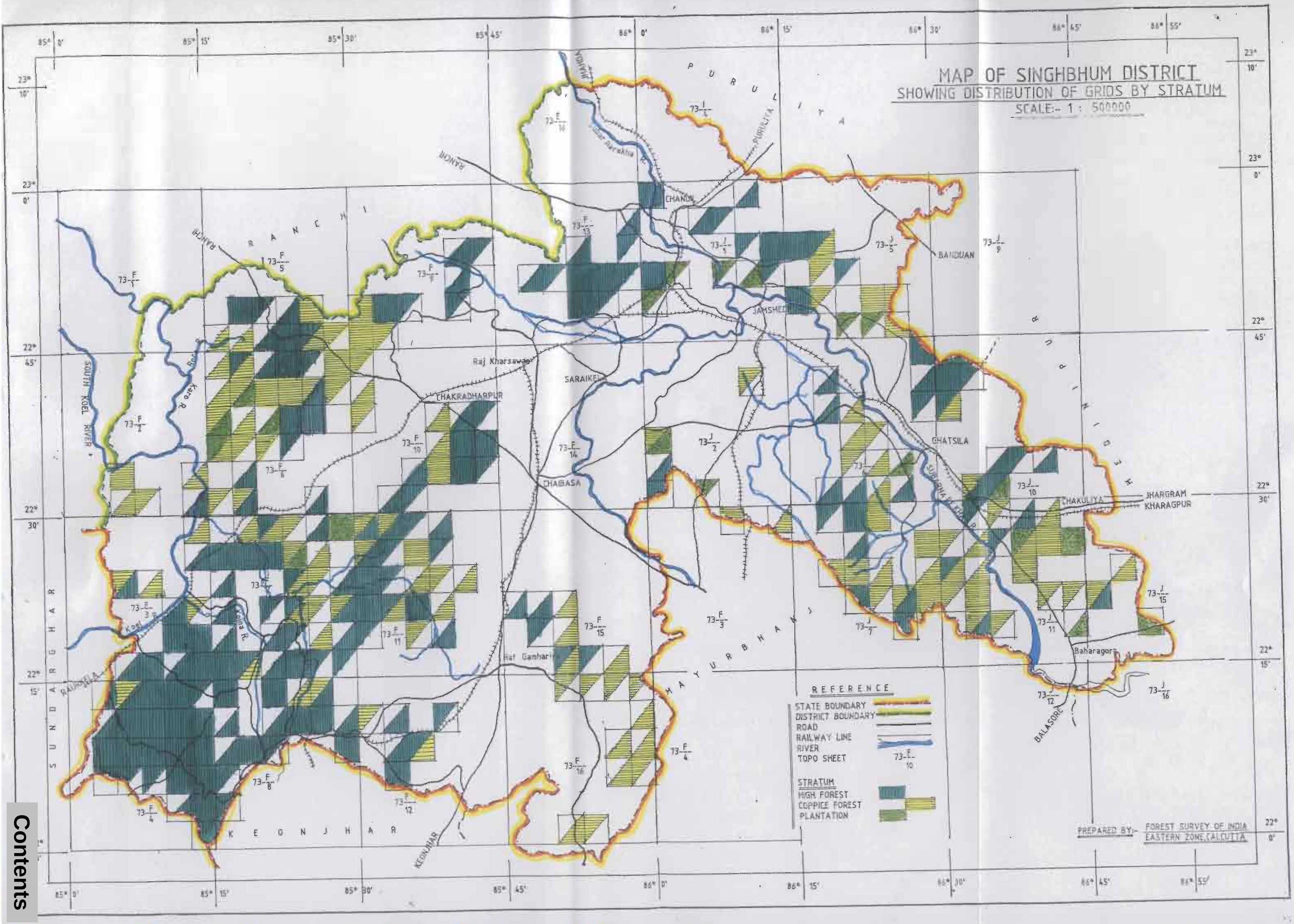

MAP OF BIHAR
scale:-1:2500,000
SHOWING PROJECT AREA IN HATCH
NEPAL
PASHCHIM CHAMPARAN
PURBA CHAMPARAN
SITAMARHI
GOPALGANJ
MADHUBANI
UTTAR PRADESH
Siwan
SIWAN
SARAN
MUZAFFARPUR
DARBHANGA
SAHARSA
PURNIA
MADHEPURA
VAISHALI
SAMASTIPUR
BEGUSARAI
KHAGARIA
Katihar
KATIHAR
BHOJPUR
PATNA
NALANDA
JAHANABAD
Sasaram
ROHTAS
Kiul
MUNGER
BHAGALPUR
GODDA
SAHIBGANJ
Gaya
NAWADA
BANKA
AURANGABAD
GAYA
Kodarma
DEOGARH
SANTHAL PARGANA
Barhi
GIRIDIH
HAZARIBAG
Hazaribag
PALAMU
Bokaro
DHANBAD
Dhanbad
LOHARDAGA
Ranchi
WEST BENGAL
GUMLA
RANCHI
MADHYA PRADESH
Jamshedpur
Chaibasa
SINGHBHUM
ORISSA
26° 0'
22° 0'
84° 0'
86° 0'
88° 0'

Contents


MAP OF SINGHBHUM DISTRICT
SHOWING DISTRIBUTION OF GRIDS BY STRATUM
SCALE:- 1 : 500000
PURULIYA
RANCHI
SUNDARGHAR
KEONJHAR
MAYURBHANJ
BALASORE
CHANDIL
BAHDUAN
JAMSHEDPUR
SARAIKELA
CHAKRADHARPUR
CHAIBASA
GHATSILA
CHAKULIYA
JHARGRAM
KHARAGPUR
Baharagora
Raj Kharsawan
Hat Gamharia
SOUTH KOEL RIVER
Kano R.
Koina R.
Kapi
Rajmela
Subarnarekha R.
Jhamon
Kumar Barakha R.
REFERENCE
STATE BOUNDARY
DISTRICT BOUNDARY
ROAD
RAILWAY LINE
RIVER
TOPO SHEET
STRATUM
HIGH FOREST
COPPICE FOREST
PLANTATION
PREPARED BY:- FOREST SURVEY OF INDIA
EASTERN ZONE, CALCUTTA

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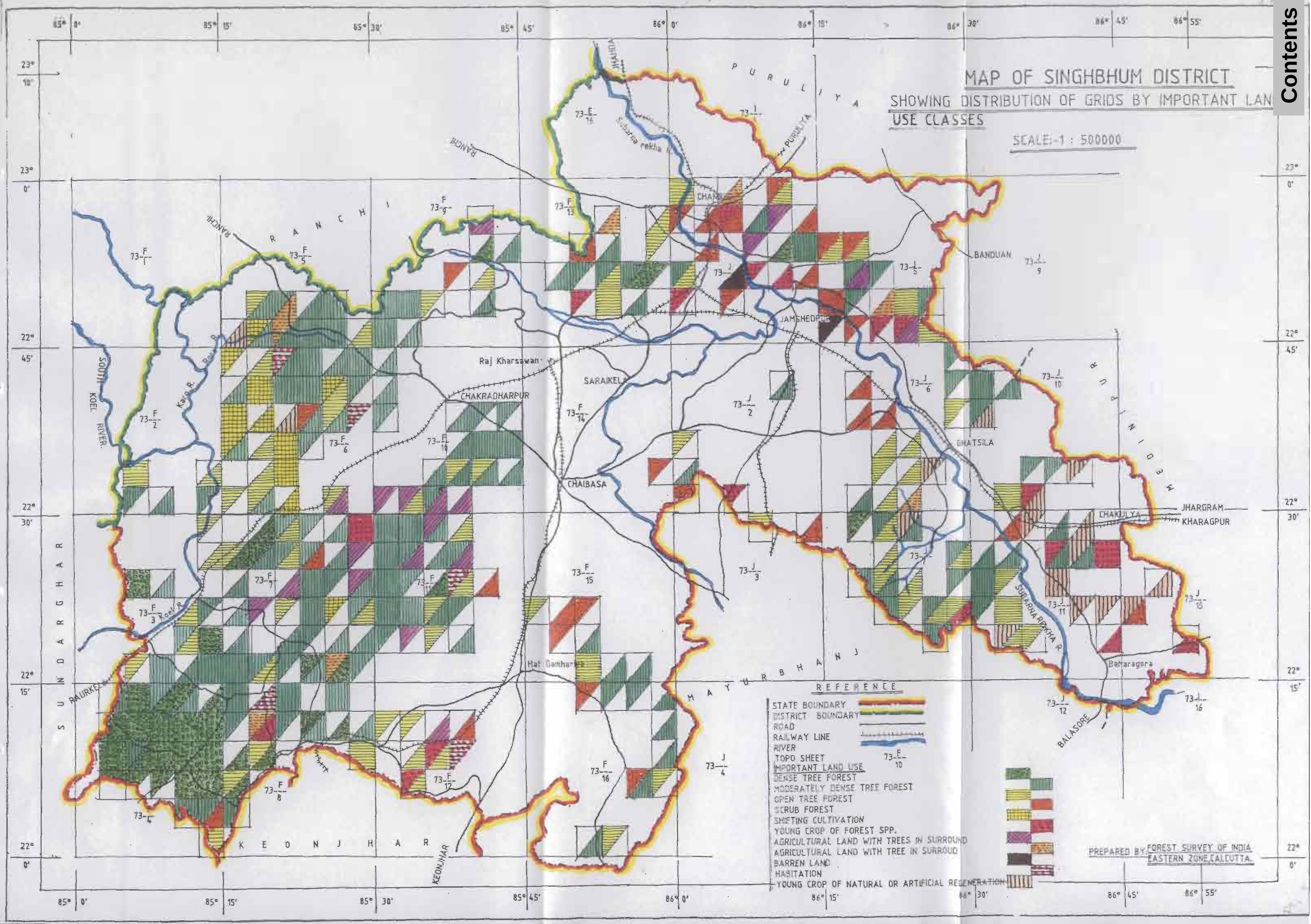
MAP OF SINGHBHUM DISTRICT
SHOWING DISTRIBUTION OF GRIDS BY IMPORTANT LAND USE CLASSES
SCALE:-1 : 500000
PURULIYA
RANCHI
SUNDARGHAR
KEONJHAR
MAYURBHANJ
MIDNAPURE
BALASORE
JAMSHEDPUR
CHAKRADHARPUR
SARAIKELA
CHAIBASA
GHATSILA
CHAKULIYA
JHARGRAM
KHARAGPUR
BANDUAN
Raj Kharsawan
Hat Gamharia
Baharagora
RAURKELA
KEONJHAR
SUBARNAREKHA R.
SOUTH KOEL RIVER
Karo R.
Roro R.
REFERENCE
STATE BOUNDARY
DISTRICT BOUNDARY
ROAD
RAILWAY LINE
RIVER
TOPO SHEET
IMPORTANT LAND USE
DENSE TREE FOREST
MODERATELY DENSE TREE FOREST
OPEN TREE FOREST
SCRUB FOREST
SHIFTING CULTIVATION
YOUNG CROP OF FOREST SPP.
AGRICULTURAL LAND WITH TREES IN SURROUND
AGRICULTURAL LAND WITH TREE IN SURROUD
BARREN LAND
HABITATION
YOUNG CROP OF NATURAL OR ARTIFICIAL REGENERATION
PREPARED BY: FOREST SURVEY OF INDIA
EASTERN ZONE, CALCUTTA.

PART - II
(STATISTICAL TABLES)

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TABLES:

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1 2	- do -	Coppice forest	4-6
1 3	- do -	Plantation forest	7
2 1	Distribution of total number of stems by species and diameter classes (in cm)	High forest	8-10
2 2	- do -	Coppice forest	11-13
2 3	- do -	Plantation forest	14
3 1	Distribution of volume(m^3)/ha by species and diameter classes (in cm)	High forest	15-17
3 2	- do -	Coppice forest	18-20
3 3	- do -	Plantation forest	21
4 1	Distribution of total volume by species and diameter classes (in cm)	High forest	22-25
4 2	- do -	Coppice forest	26-28
4 3	- do -	Plantation forest	29

TABLE NO.1.1

STEMS PER HACTARE(NO) BY SPECIES AND DIAMETER CLASSES(IN CM.)

DISTRICT- SINGBHUM STRATA - HIGH FOREST

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Acer laevigatum	17	.231	.000	.000	.000	.000	.000	.000	.000	.000	.000	.231
Adina cordifolia	28	2.546	.509	.231	.370	.000	.000	.046	.000	.000	.000	3.704
Adina oligocephala	30	.000	.000	.000	.000	.046	.000	.000	.000	.000	.000	.046
Aegle marmelos	32	.833	.046	.000	.000	.000	.000	.000	.000	.000	.000	.880
Albizzia procera	50	.139	.231	.139	.000	.000	.000	.000	.000	.000	.000	.509
Albizzia species	51	1.111	.093	.139	.046	.000	.000	.000	.000	.000	.000	1.389
Amoora species	65	.000	.046	.000	.000	.000	.000	.000	.000	.000	.000	.046
Anogeissus acuminata	71	.046	.000	.000	.000	.000	.000	.000	.000	.000	.000	.046
Anogeissus latifolia	72	12.268	4.398	1.528	.463	.093	.000	.000	.000	.000	.000	18.750
Apnanamixis polystachya	80	.046	.000	.000	.000	.000	.000	.000	.000	.000	.000	.046
Azadirachta indica	103	.324	.000	.000	.000	.000	.000	.000	.000	.000	.000	.324
Bauhinia purpurea	114	.185	.000	.000	.000	.000	.000	.000	.000	.000	.000	.185
Bauhinia retusa	116	.093	.000	.000	.000	.000	.000	.000	.000	.000	.000	.093
Bauhinia species	118	2.407	.324	.046	.185	.000	.000	.000	.000	.000	.000	2.963
Bombax ceiba	131	.093	.000	.185	.000	.000	.000	.000	.000	.000	.000	.278
Boswellia serrata	133	.602	.509	.417	.231	.000	.000	.000	.000	.000	.000	1.759
Bridelia retusa	138	3.333	.880	.185	.139	.046	.000	.000	.000	.000	.000	4.583
Buchanania lanzan	143	13.194	2.176	.324	.093	.000	.000	.000	.000	.000	.000	15.787
Butea monosperma	146	.509	.278	.185	.000	.000	.000	.000	.000	.000	.000	.972
Callicarpa arborea	150	.046	.000	.000	.000	.000	.000	.000	.000	.000	.000	.046
Canarium species	168	.046	.000	.000	.000	.000	.000	.000	.000	.000	.000	.046
Careya arborea	177	.231	.185	.000	.000	.000	.000	.000	.000	.000	.000	.417
Cassia fistula	186	.602	.046	.046	.000	.000	.000	.000	.000	.000	.000	.694
Cedrela serrata	197	.185	.093	.000	.000	.000	.000	.000	.000	.000	.000	.278
Toona ciliata	198	.278	.324	.000	.000	.000	.000	.000	.000	.000	.000	.602
Chloroxylon swietenia	206	.185	.000	.046	.000	.000	.000	.000	.000	.000	.000	.231
Chukrasia vellutina	208	.046	.093	.000	.046	.000	.000	.000	.000	.000	.000	.185
Cleistanthus collinus	218	5.602	.278	.000	.000	.000	.000	.000	.000	.000	.000	5.880
Dalbergia latifolia	266	.093	.000	.000	.000	.000	.000	.000	.000	.000	.000	.093
Dalbergia sissoo	268	.093	.000	.000	.000	.000	.000	.000	.000	.000	.000	.093

Contents

CONT.TABLE NO.1.1

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
illenia pentagyna	278	.231	.139	.139	.000	.000	.000	.000	.000	.000	.000	.509
iospyros melanoxylon	285	4.491	1.806	.602	.231	.093	.000	.000	.000	.000	.000	7.222
iospyros species	292	.046	.093	.046	.000	.000	.000	.000	.000	.000	.000	.185
uabanga grandiflora	303	.046	.000	.000	.000	.000	.000	.000	.000	.000	.000	.046
mblica officinalis	325	.694	.046	.000	.000	.000	.000	.000	.000	.000	.000	.741
ndostermum chinense	326	.278	.046	.000	.000	.000	.000	.000	.000	.000	.000	.324
rythrina variegata	341	.509	.278	.000	.000	.000	.000	.000	.000	.000	.000	.787
rythrina species	342	.093	.093	.000	.046	.000	.000	.000	.000	.000	.000	.231
icus religiosa	381	.046	.093	.000	.000	.000	.000	.000	.000	.000	.000	.139
icus racemosa	382	.093	.093	.000	.000	.000	.000	.000	.000	.000	.000	.185
icus species	385	.139	.185	.046	.000	.046	.000	.000	.000	.046	.000	.463
lacourtia species	391	.324	.000	.000	.000	.000	.000	.000	.000	.000	.000	.324
arderia resinifera	405	.463	.370	.046	.000	.000	.000	.000	.000	.000	.000	.880
aruga pinnata	407	.694	.231	.000	.000	.000	.000	.000	.000	.000	.000	.926
melina arborea	420	.602	.231	.139	.046	.046	.000	.000	.000	.000	.000	1.065
rewia microcos	428	.185	.046	.000	.000	.000	.000	.000	.000	.000	.000	.231
rewia tiliaefolia	431	.046	.000	.000	.000	.000	.000	.000	.000	.000	.000	.046
rewia species	432	.093	.000	.000	.000	.000	.000	.000	.000	.000	.000	.093
ollarrhena antidysenterica	452	.509	.046	.000	.000	.000	.000	.000	.000	.000	.000	.556
ploptelea integrifolia	456	.139	.000	.046	.000	.000	.000	.000	.000	.000	.000	.185
ymenodictyon excelsum	470	.139	.000	.000	.000	.000	.000	.000	.000	.000	.000	.139
ydia calycina	501	.926	.185	.046	.046	.000	.000	.000	.000	.000	.000	1.204
agerstroemia lanceolata	504	.046	.000	.000	.000	.000	.000	.000	.000	.000	.000	.046
agerstroemia parviflora	505	2.037	.231	.093	.000	.000	.000	.000	.000	.000	.000	2.361
annea coromandelica	509	6.759	1.759	.463	.185	.093	.000	.000	.000	.000	.000	9.259
indera nessiana	521	.046	.000	.000	.000	.000	.000	.000	.000	.000	.000	.046
achillus parviflora	557	.046	.000	.000	.000	.000	.000	.000	.000	.000	.000	.046
adhuca latifolia	561	3.056	1.898	.417	.231	.093	.139	.000	.000	.000	.000	5.833
allotus philippinensis	565	.231	.046	.000	.000	.000	.000	.000	.000	.000	.000	.278
angifera indica	569	.139	.093	.046	.093	.000	.000	.000	.046	.000	.000	.417
eliosma species	589	.000	.046	.000	.000	.000	.000	.000	.000	.000	.000	.046

Contents

CONT.TABLE NO.1.1

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Memecylon angustifolium	590	.046	.000	.000	.000	.000	.000	.000	.000	.000	.000	.046
Mitragyna parviflora	611	.324	.093	.000	.046	.000	.000	.000	.000	.000	.000	.463
Morinda tinctoria	613	.139	.000	.000	.000	.000	.000	.000	.000	.000	.000	.139
Nyctanthes arbortristis	637	.185	.000	.000	.000	.000	.000	.000	.000	.000	.000	.185
Ougeinia dalbergoiides	653	1.019	.093	.093	.000	.000	.000	.000	.000	.000	.000	1.204
Pongamia pinnata	701	.231	.000	.000	.000	.000	.000	.000	.000	.000	.000	.231
Pterocarpus marsupium	722	3.194	.694	.324	.139	.046	.000	.000	.000	.000	.000	4.398
Pterospermum acerifolium	725	.231	.000	.000	.000	.000	.000	.000	.000	.000	.000	.231
Pterospermum species	731	.046	.046	.000	.000	.000	.000	.000	.000	.000	.000	.093
Saccopetalum tomentosum	770	.046	.000	.000	.000	.000	.000	.000	.000	.000	.000	.046
Schleichera trijuga	795	.417	.278	.278	.046	.046	.000	.000	.000	.000	.000	1.065
Schrebera swienteniodes	796	.185	.093	.000	.000	.000	.000	.000	.000	.000	.000	.278
Semecarpus anacardium	798	3.426	.463	.046	.000	.000	.000	.000	.000	.000	.000	3.935
Semecarpus kurzii	799	.231	.000	.000	.000	.000	.000	.000	.000	.000	.000	.231
Shorea robusta	802	58.750	22.546	12.639	6.806	1.574	.139	.139	.000	.000	.000	102.592
Soymida febrifuga	809	.417	.000	.000	.000	.000	.000	.000	.000	.000	.000	.417
Spondias pinnata	812	.185	.093	.000	.000	.000	.000	.000	.000	.000	.000	.278
Sterculia villosa	821	.880	.139	.046	.093	.000	.000	.000	.000	.000	.000	1.157
Stereospermum personatum	824	.000	.046	.000	.000	.000	.000	.000	.000	.000	.000	.046
Strychnos potatorum	832	.046	.000	.000	.000	.000	.000	.000	.000	.000	.000	.046
Syzygium cumini	843	2.639	.556	.139	.046	.000	.000	.000	.000	.000	.000	3.380
Syzygium species	850	.833	.278	.093	.046	.000	.000	.000	.000	.000	.000	1.250
Tabernaemontanadichotama	852	.000	.046	.000	.000	.000	.000	.000	.000	.000	.000	.046
Terminalia arjuna	860	.000	.000	.139	.000	.046	.046	.046	.000	.000	.000	.278
Terminalia belerica	861	.880	.231	.093	.000	.000	.000	.000	.000	.000	.000	1.204
Terminalia chebula	864	1.019	.231	.000	.000	.000	.000	.000	.000	.000	.000	1.250
Terminalia citrina	865	.093	.000	.000	.000	.000	.000	.000	.000	.000	.000	.093
Terminalia crenulata	866	14.583	3.472	1.157	.509	.093	.046	.000	.000	.000	.000	19.861
Trewia nudiflora	880	.046	.000	.000	.000	.000	.000	.000	.000	.000	.000	.046
Ulmus lancifolia	886	.046	.046	.000	.000	.000	.000	.000	.000	.000	.000	.093
Wrightia tomentosa	912	.046	.000	.000	.000	.000	.000	.000	.000	.000	.000	.046
Xylia xylocarpa	919	.046	.000	.000	.000	.000	.000	.000	.000	.000	.000	.046
Zizyphus zylopyra	929	.370	.000	.000	.000	.000	.000	.000	.000	.000	.000	.370
Zizyphus species	930	1.204	.093	.000	.000	.000	.000	.000	.000	.000	.000	1.296
Unidentified trees	944	20.417	2.130	.556	.139	.000	.000	.000	.000	.000	.000	23.241
TOTAL		180.740	50.231	21.204	10.324	2.361	.370	.231	.046	.046	.000	265.554
PERCENTAGE		68.06	18.92	7.98	3.89	.89	.14	.09	.02	.02	.00	100.00

Contents

TABLE NO.1.2

STEMS PER HACTARE(NO) BY SPECIES AND DIAMETER CLASSES(IN CM.)

DISTRICT- SINGBHUM STRATA - COPPICE FOREST

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Adina cordifolia	28	.945	.551	.000	.000	.000	.000	.000	.000	.000	.000	1.496
Aegle marmelos	32	.315	.000	.000	.000	.000	.000	.000	.000	.000	.000	.315
Albizzia procera	50	.236	.079	.000	.000	.000	.000	.000	.000	.000	.000	.315
Albizzia species	51	.236	.000	.000	.000	.000	.000	.000	.000	.000	.000	.236
Anogeissus latifolia	72	8.031	1.969	.079	.000	.000	.079	.000	.000	.000	.000	10.157
Azadirachta indica	103	.157	.000	.000	.000	.000	.000	.000	.000	.000	.000	.157
Bauhinia retusa	116	.079	.000	.000	.000	.000	.000	.000	.000	.000	.000	.079
Bauhinia species	118	1.496	.079	.000	.000	.000	.000	.000	.000	.000	.000	1.575
Bombax ceiba	131	.079	.079	.000	.000	.000	.000	.000	.079	.079	.000	.315
Boswellia serrata	133	2.126	.472	.000	.157	.000	.000	.000	.000	.000	.000	2.756
Bridelia retusa	138	1.496	.709	.079	.000	.000	.000	.000	.000	.000	.000	2.283
Buchanania lanzan	143	14.803	2.677	.315	.079	.000	.000	.000	.000	.000	.000	17.874
Callicarpa arborea	150	.079	.000	.000	.000	.000	.000	.000	.000	.000	.000	.079
Careya arborea	177	.236	.000	.000	.000	.000	.000	.000	.000	.000	.000	.236
Casearia rubescens	182	.079	.000	.000	.000	.000	.000	.000	.000	.000	.000	.079
Cassia fistula	186	.709	.079	.000	.000	.000	.000	.000	.000	.000	.000	.787
Casia species	189	.157	.000	.000	.000	.000	.000	.000	.000	.000	.000	.157
Cleistanthus collinus	218	1.496	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.496
Cochlospermum religiosum	223	1.024	.079	.000	.000	.000	.000	.000	.000	.000	.000	1.102
Dalbergia latifolia	266	.079	.000	.000	.000	.000	.000	.000	.000	.000	.000	.079
Dillenia pentagyna	278	.157	.000	.000	.079	.000	.000	.000	.000	.000	.000	.236
Diospyros cordifolia	282	.079	.000	.000	.000	.000	.000	.000	.000	.000	.000	.079
Diospyros melanoxylon	285	4.803	1.024	.551	.315	.000	.000	.000	.000	.000	.000	6.693
Diospyros species	292	.394	.000	.000	.000	.000	.000	.000	.000	.000	.000	.394
Emblica officinalis	325	.236	.000	.000	.000	.000	.000	.000	.000	.000	.000	.236
Erythrina variegata	341	.236	.157	.000	.000	.000	.000	.000	.000	.000	.000	.394
Erythrina species	342	.079	.000	.000	.000	.000	.000	.000	.000	.000	.000	.079
Eugenia cymosa	350	.157	.000	.000	.000	.000	.000	.000	.000	.000	.000	.157
Eugenia grandis	353	.079	.000	.000	.000	.000	.000	.000	.000	.000	.000	.079
Eugenia species	358	.630	.000	.000	.000	.000	.000	.000	.000	.000	.000	.630

Contents

CONT.TABLE NO.1.2

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Ficus bengalensis	375	.079	.000	.000	.000	.000	.079	.000	.000	.000	.000	.157
Ficus racemosa	382	.000	.157	.079	.000	.000	.000	.000	.000	.000	.000	.236
Ficus species	385	.551	.079	.079	.000	.000	.000	.000	.000	.000	.000	.709
Flacourtia species	391	.394	.000	.000	.000	.000	.000	.000	.000	.000	.000	.394
Gardenia resinifera	405	.551	.000	.079	.000	.000	.000	.000	.000	.000	.000	.630
Garuga pinnata	407	.630	.315	.079	.000	.000	.000	.000	.000	.000	.000	1.024
Gmelina arborea	420	1.024	.236	.000	.000	.079	.000	.000	.000	.000	.000	1.339
Grewia microcos	428	.157	.000	.000	.000	.000	.000	.000	.000	.000	.000	.157
Grewia tiliaefolia	431	.157	.000	.000	.000	.000	.000	.000	.000	.000	.000	.157
Hollarrhena antidysenterica	452	.157	.000	.000	.000	.000	.000	.000	.000	.000	.000	.157
Hopea odorata	459	.000	.079	.000	.000	.000	.000	.000	.000	.000	.000	.079
Kydia calycina	501	.079	.000	.000	.000	.000	.000	.000	.000	.000	.000	.079
Lagerstroemia parviflora	505	.787	.236	.000	.000	.000	.000	.000	.000	.000	.000	1.024
Lannea coromandelica	509	3.937	.236	.000	.000	.000	.000	.000	.000	.000	.000	4.173
Madhuca latifolia	561	2.441	.472	.394	.315	.079	.000	.000	.000	.079	.000	3.780
Mangifera indica	569	.079	.000	.157	.000	.079	.000	.000	.079	.000	.000	.394
Miliusa tomentosa	605	.079	.000	.000	.000	.000	.000	.000	.000	.000	.000	.079
Mitragyna parviflora	611	.079	.000	.079	.000	.000	.000	.000	.000	.000	.000	.157
Morinda tinctoria	613	.157	.000	.000	.000	.000	.000	.000	.000	.000	.000	.157
Nyctanthes arbortristis	637	.079	.000	.000	.000	.000	.000	.000	.000	.000	.000	.079
Ougeinia dalbergoiides	653	.709	.079	.079	.000	.000	.000	.000	.000	.000	.000	.866
Phoebe species	673	.079	.000	.000	.000	.000	.000	.000	.000	.000	.000	.079
Pterocarpus marsupium	722	2.362	.630	.079	.000	.000	.000	.000	.000	.000	.000	3.071
Schleichera trijuga	795	.709	.394	.079	.000	.000	.000	.079	.000	.000	.000	1.260
Semecarpus anacardium	798	3.937	.236	.000	.000	.000	.000	.000	.000	.000	.000	4.173
Shorea robusta	802	52.756	8.031	4.882	1.575	.157	.000	.000	.000	.000	.000	67.401
Soymida febrifuga	809	.236	.000	.000	.000	.000	.000	.000	.000	.000	.000	.236
Spondias pinnata	812	.079	.000	.000	.000	.000	.000	.000	.000	.000	.000	.079
Sterculia villosa	821	.079	.079	.000	.000	.000	.000	.000	.000	.000	.000	.157
Strychnos potatorum	832	.315	.000	.000	.000	.000	.000	.000	.000	.000	.000	.315
Syzygium cumini	843	1.260	1.024	.079	.079	.000	.000	.000	.000	.000	.000	2.441
Syzygium species	850	.079	.000	.000	.000	.000	.000	.000	.000	.000	.000	.079
Tectona grandis	858	.394	.000	.000	.000	.000	.000	.000	.000	.000	.000	.394
Terminalia belerica	861	.472	.000	.079	.000	.000	.000	.000	.000	.000	.000	.551
Terminalia chebula	864	1.181	.079	.000	.000	.000	.000	.000	.000	.000	.000	1.260

Contents

CONT.TABLE NO.1.2

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Terminalia citrina	865	.079	.000	.000	.157	.000	.000	.000	.000	.000	.000	.236
Terminalia crenulata	866	8.819	1.496	.315	.079	.000	.000	.000	.000	.000	.000	10.709
Weightia tinctoria	910	.079	.000	.000	.000	.000	.000	.000	.000	.000	.000	.079
Zizyphus glabrata	926	.315	.000	.000	.000	.000	.000	.000	.000	.000	.000	.315
Zizyphus mauratiana	927	.157	.000	.000	.000	.000	.000	.000	.000	.000	.000	.157
Zizyphus species	930	.394	.079	.000	.000	.000	.000	.000	.000	.000	.000	.472
Unidentified trees	944	7.795	.394	.000	.236	.000	.000	.000	.000	.000	.000	8.425
TOTAL		134.409	22.283	7.559	3.071	.394	.157	.079	.157	.157	.000	168.267
PERCENTAGE		79.88	13.24	4.49	1.82	.23	.09	.05	.09	.09	.00	100.00

Contents

TABLE NO.1.3

STEMS PER HACTARE(NO) BY SPECIES AND DIAMETER CLASSES(IN CM.)

DISTRICT- SINGBHUM STRATA - PLANTATION

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Albizzia species	51	.952	.000	.000	.000	.000	.000	.000	.000	.000	.000	.952
Anacardium occidentale	66	4.286	1.429	.476	.000	.000	.000	.000	.000	.000	.000	6.190
Bombax ceiba	131	.476	.000	.000	.000	.000	.000	.000	.000	.000	.000	.476
Bridelia retusa	138	4.762	.000	.000	.000	.000	.000	.000	.000	.000	.000	4.762
Buchanania lanzan	143	.476	.000	.476	.000	.000	.000	.000	.000	.000	.000	.952
Butea monosperma	146	.476	.000	.000	.000	.000	.000	.000	.000	.000	.000	.476
Dalbergia latifolia	266	.952	.000	.000	.000	.000	.000	.000	.000	.000	.000	.952
Diospyros melanoxylon	285	.000	.000	1.905	.000	.000	.000	.000	.000	.000	.000	1.905
Ficus bengalensis	375	.000	.000	.000	.000	.000	.000	.000	.476	.000	.000	.476
Garuga pinnata	407	.476	.000	.000	.000	.000	.000	.000	.000	.000	.000	.476
Grewia microcos	428	2.857	.000	.000	.000	.000	.000	.000	.000	.000	.000	2.857
Madhuca latifolia	561	.476	.952	.000	.476	.476	.476	.000	.476	.000	.000	3.333
Shorea robusta	802	.476	.000	.000	.000	.000	.000	.000	.000	.000	.000	.476
Syzygium cumini	843	.952	.000	.476	.000	.000	.000	.000	.000	.000	.000	1.429
Tectona grandis	858	10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	10.000
Terminalia chebula	864	.000	.000	.000	.476	.000	.000	.000	.000	.000	.000	.476
Terminalia crenulata	866	.000	.476	.000	.000	.000	.000	.000	.000	.000	.000	.476
Acacia Auriculiformis(A06)	943	1.429	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.429
Unidentified trees	944	1.429	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.429
TOTAL		30.476	2.857	3.333	.952	.476	.476	.000	.952	.000	.000	39.524
PERCENTAGE		77.11	7.23	8.43	2.41	1.20	1.20	.00	2.41	.00	.00	100.00

Contents

TABLE NO.2.1

TOTAL STEMS(IN NO.) BY SPECIES AND DIAMETER CLASSES(IN CM.)

DISTRICT- SHINGBHUM STRATA-:HIGH FOREST

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Acer laevigatum	17	49321	0	0	0	0	0	0	0	0	0	49321
Adina cordifolia	28	543604	108678	49321	78999	0	0	9821	0	0	0	790852
Adina oligocephala	30	0	0	0	0	9821	0	0	0	0	0	9821
Aegle marmelos	32	177856	9821	0	0	0	0	0	0	0	0	187891
Albizzia procera	50	29678	49321	29678	0	0	0	0	0	0	0	108678
Albizzia species	51	237212	19856	29678	9821	0	0	0	0	0	0	296569
Amoora species	65	0	9821	0	0	0	0	0	0	0	0	9821
Anogeissus acuminata	71	9821	0	0	0	0	0	0	0	0	0	9821
Anogeissus latifolia	72	2619377	939030	326247	98856	19856	0	0	0	0	0	4003368
Aphanamixis polystachya	80	9821	0	0	0	0	0	0	0	0	0	9821
Azadirachta indica	103	69178	0	0	0	0	0	0	0	0	0	69178
Bauhinia purpurea	114	39499	0	0	0	0	0	0	0	0	0	39499
Bauhinia retusa	116	19856	0	0	0	0	0	0	0	0	0	19856
Bauhinia species	118	513925	69178	9821	39499	0	0	0	0	0	0	632639
Bombax ceiba	131	19856	0	39499	0	0	0	0	0	0	0	59356
Boswellia serrata	133	128534	108678	89034	49321	0	0	0	0	0	0	375569
Briedelia retusa	138	711638	187891	39499	29678	9821	0	0	0	0	0	978530
Buchanania lanzan	143	2817090	464604	69178	19856	0	0	0	0	0	0	3370729
Butea monosperma	146	108678	59356	39499	0	0	0	0	0	0	0	207534
Callicarpa arborea	150	9821	0	0	0	0	0	0	0	0	0	9821
Canarium species	168	9821	0	0	0	0	0	0	0	0	0	9821
Careya arborea	177	49321	39499	0	0	0	0	0	0	0	0	89034
Cassia fistula	186	128534	9821	9821	0	0	0	0	0	0	0	148178
Cedrela serrata	197	39499	19856	0	0	0	0	0	0	0	0	59356
Toona ciliata	198	59356	69178	0	0	0	0	0	0	0	0	128534
Chloroxylon swietenia	206	39499	0	9821	0	0	0	0	0	0	0	49321
Chukrasia vellutina	208	9821	19856	0	9821	0	0	0	0	0	0	39499
Cleistanthus collinus	218	1196099	59356	0	0	0	0	0	0	0	0	1255456
Dalbergia latifolia	266	19856	0	0	0	0	0	0	0	0	0	19856

Contents

Cont. of Table No.2.1

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Dalbergia sissoo	268	19856	0	0	0	0	0	0	0	0	0	19856
Dillenia pentagyna	278	49321	29678	29678	0	0	0	0	0	0	0	108678
Diospyros melanoxylon	285	958886	385604	128534	49321	19856	0	0	0	0	0	1541990
Diospyros species	292	9821	19856	9821	0	0	0	0	0	0	0	39499
Duabanga grandiflora	303	9821	0	0	0	0	0	0	0	0	0	9821
Emblica officinalis	325	148178	9821	0	0	0	0	0	0	0	0	158213
Endospermum chinense	326	59356	9821	0	0	0	0	0	0	0	0	69178
Erythrina variegata	341	108678	59356	0	0	0	0	0	0	0	0	168034
Erythrina species	342	19856	19856	0	9821	0	0	0	0	0	0	49321
Ficus religiosa	381	9821	19856	0	0	0	0	0	0	0	0	29678
Ficus recemosa	382	19856	19856	0	0	0	0	0	0	0	0	39499
Ficus species	385	29678	39499	9821	0	9821	0	0	0	9821	0	98856
Flacourtia species	391	69178	0	0	0	0	0	0	0	0	0	69178
Gardenia resinifera	405	98856	78999	9821	0	0	0	0	0	0	0	187891
Garuga pinnata	407	148178	49321	0	0	0	0	0	0	0	0	197713
Gmelina arborea	420	128534	49321	29678	9821	9821	0	0	0	0	0	227391
Grewia microcos	428	39499	9821	0	0	0	0	0	0	0	0	49321
Grewia tiliaefolia	431	9821	0	0	0	0	0	0	0	0	0	9821
Grewia species	432	19856	0	0	0	0	0	0	0	0	0	19856
Hollarrhena antidysenterica	452	108678	9821	0	0	0	0	0	0	0	0	118713
Holoptelea integrifolia	456	29678	0	9821	0	0	0	0	0	0	0	39499
Hymenodictyon excelsum	470	29678	0	0	0	0	0	0	0	0	0	29678
Kydia calycina	501	197713	39499	9821	9821	0	0	0	0	0	0	257069
Lagerstroemia lanceolata	504	9821	0	0	0	0	0	0	0	0	0	9821
Lagerstroemia parviflora	505	434925	49321	19856	0	0	0	0	0	0	0	504104
Larnea coromandelica	509	1443134	375569	98856	39499	19856	0	0	0	0	0	1976916
Lindera nessiana	521	9821	0	0	0	0	0	0	0	0	0	9821
Machilus parviflora	557	9821	0	0	0	0	0	0	0	0	0	9821
Madhuca latifolia	561	652495	405247	89034	49321	19856	29678	0	0	0	0	1245421
Mallotus philippinensis	565	49321	9821	0	0	0	0	0	0	0	0	59356
Mangifera indica	569	29678	19856	9821	19856	0	0	0	9821	0	0	89034
Melliosma species	589	0	9821	0	0	0	0	0	0	0	0	9821

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Cont. of Table No.2.1

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTA
Memecylon angustifolium	590	9821	0	0	0	0	0	0	0	0	0	9821
Mitragyna parviflora	611	69178	19856	0	9821	0	0	0	0	0	0	98856
Morinda tinctoria	613	29678	0	0	0	0	0	0	0	0	0	29678
Nyctanthes arbortristis	637	39499	0	0	0	0	0	0	0	0	0	39499
Ougeinia galbergoiides	653	217569	19856	19856	0	0	0	0	0	0	0	257069
Porgamia pinnata	701	49321	0	0	0	0	0	0	0	0	0	49321
Pterocarpus marsupium	722	681960	148178	69178	29678	9821	0	0	0	0	0	939030
Pterospermum acerifolium	725	49321	0	0	0	0	0	0	0	0	0	49321
Pterospermum species	731	9821	9821	0	0	0	0	0	0	0	0	19856
Saccopetalum tomentosum	770	9821	0	0	0	0	0	0	0	0	0	9821
Schleichera trijuga	795	89034	59356	59356	9821	9821	0	0	0	0	0	227391
Schrebera swienteniodes	796	39499	19856	0	0	0	0	0	0	0	0	59356
Semecarpus anacardium	798	731495	98856	9821	0	0	0	0	0	0	0	840173
Semecarpus kurzii	799	49321	0	0	0	0	0	0	0	0	0	49321
Shorea robusta	80	212543889	48138	64269	8590	145316	9336069	29678	29678	0	0	021904726
Soymida febrifuga	809	89034	0	0	0	0	0	0	0	0	0	89034
Spondias pinnata	812	39499	19856	0	0	0	0	0	0	0	0	59356
Sterculia villosa	821	187891	29678	9821	19856	0	0	0	0	0	0	247034
Stereospermum personatum	824	0	9821	0	0	0	0	0	0	0	0	9821
Strychnos potatorum	832	9821	0	0	0	0	0	0	0	0	0	9821
Syzygium cumini	843	563460	118713	29678	9821	0	0	0	0	0	0	721673
Syzygium species	850	177856	59356	19856	9821	0	0	0	0	0	0	266891
Tabernaemontanadichotama	852	0	9821	0	0	0	0	0	0	0	0	9821
Terminalia arjuna	860	0	0	29678	0	9821	9821	9821	0	0	0	59356
Terminalia belerica	861	187891	49321	19856	0	0	0	0	0	0	0	257069
Terminalia chebula	864	217569	49321	0	0	0	0	0	0	0	0	266891
Terminalia citrina	865	19856	0	0	0	0	0	0	0	0	0	19856
Terminalia crenulata	866	3113660	741317	247034	108678	19856	9821	0	0	0	0	4240581
Trewia nudiflora	880	9821	0	0	0	0	0	0	0	0	0	9821
Ulmus lanaifolia	886	9821	9821	0	0	0	0	0	0	0	0	19856
Wrightia tomentosa	912	9821	0	0	0	0	0	0	0	0	0	9821
Xylia xylocarpa	919	9821	0	0	0	0	0	0	0	0	0	9821
Zizyphus xylopyra	929	78999	0	0	0	0	0	0	0	0	0	78999
Zizyphus species	930	257069	19856	0	0	0	0	0	0	0	0	276712
Unidentified trees	944	4359295	454782	118713	29678	0	0	0	0	0	0	4962255
TOTAL		38590340	10724971	4527330	2204308	50[illegible]104	79999	49321	9821	9821	0	56699228

TABLE NO.2.2

TOTAL STEMS(IN NO.) BY SPECIES AND DIAMETER CLASSES(IN CM.)

DISTRICT-SHINGBHUM STRATA: COPPICE FOREST

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Adina cordifolia	28	118633	69171	0	0	0	0	0	0	0	0	187804
Aegle marmelos	32	39544	0	0	0	0	0	0	0	0	0	39544
Albizzia procera	50	29626	9917	0	0	0	0	0	0	0	0	39544
Albizzia species	51	29626	0	0	0	0	0	0	0	0	0	29626
Anogeissus latifolia	72	1008195	247184	9917	0	0	9917	0	0	0	0	1275089
Azadirachta indica	103	19709	0	0	0	0	0	0	0	0	0	19709
Bauhinia retusa	116	9917	0	0	0	0	0	0	0	0	0	9917
Bauhinia species	118	187804	9917	0	0	0	0	0	0	0	0	197722
Bombax ceiba	131	9917	9917	0	0	0	0	0	9917	9917	0	39544
Boswellia serrata	133	266893	59253	0	19709	0	0	0	0	0	0	345982
Bridelia retusa	138	187804	89006	9917	0	0	0	0	0	0	0	286603
Buchanania lanzan	143	1858339	336065	39544	9917	0	0	0	0	0	0	2243866
Callicarpa arborea	150	9917	0	0	0	0	0	0	0	0	0	9917
Careya arborea	177	29626	0	0	0	0	0	0	0	0	0	29626
Casearia rubescens	182	9917	0	0	0	0	0	0	0	0	0	9917
Cassia fistula	186	89006	9917	0	0	0	0	0	0	0	0	98798
Casia species	189	19709	0	0	0	0	0	0	0	0	0	19709
Cleistanthus collinus	218	187804	0	0	0	0	0	0	0	0	0	187804
Cochlospermum religiosum	223	128550	9917	0	0	0	0	0	0	0	0	138342
Dalbergia latifolia	266	9917	0	0	0	0	0	0	0	0	0	9917
Dillenia pentagyna	278	19709	0	0	9917	0	0	0	0	0	0	29626
Diospyros crumenta	282	9917	0	0	0	0	0	0	0	0	0	9917
Diospyros melanoxylon	285	602959	128550	69171	39544	0	0	0	0	0	0	840225
Diospyros species	292	49461	0	0	0	0	0	0	0	0	0	49461
Emblica officinalis	325	29626	0	0	0	0	0	0	0	0	0	29626
Erythrina variegata	341	29626	19709	0	0	0	0	0	0	0	0	49461
Erythrina species	342	9917	0	0	0	0	0	0	0	0	0	9917
Eugenia cymosa	350	19709	0	0	0	0	0	0	0	0	0	19709
Eugenia grandis	353	9917	0	0	0	0	0	0	0	0	0	9917

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Cont. of Table No.2.2

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Eugenia species	358	79088	0	0	0	0	0	0	0	0	0	79088
Ficus bengalensis	375	9917	0	0	0	0	9917	0	0	0	0	19709
Ficus racemosa	382	0	19709	9917	0	0	0	0	0	0	0	29626
Ficus species	385	69171	9917	9917	0	0	0	0	0	0	0	89006
Flacourtia species	391	49461	0	0	0	0	0	0	0	0	0	49461
Gardenia resinifera	405	69171	0	9917	0	0	0	0	0	0	0	79088
Garuga pinnata	407	79088	39544	9917	0	0	0	0	0	0	0	128550
Gmelina arborea	420	128550	29626	0	0	9917	0	0	0	0	0	168095
Grewia microcos	428	19709	0	0	0	0	0	0	0	0	0	19709
Grewia tiliaefolia	431	19709	0	0	0	0	0	0	0	0	0	19709
Holarrhena antidysenterica	452	19709	0	0	0	0	0	0	0	0	0	19709
Hopea odorata	459	0	9917	0	0	0	0	0	0	0	0	9917
Kydia calycina	501	9917	0	0	0	0	0	0	0	0	0	9917
Lagerstroemia parviflora	505	98798	29626	0	0	0	0	0	0	0	0	128550
Lannea coromandelica	509	494243	29626	0	0	0	0	0	0	0	0	523870
Madhuca latifolia	561	306438	59253	49461	39544	9917	0	0	0	9917	0	474533
Mangifera indica	569	9917	0	19709	0	9917	0	0	9917	0	0	49461
Miliusa tomentosa	605	9917	0	0	0	0	0	0	0	0	0	9917
Mitragyna parviflora	611	9917	0	9917	0	0	0	0	0	0	0	19709
Morinda tinctoria	613	19709	0	0	0	0	0	0	0	0	0	19709
Nyctanthes arbortristis	637	9917	0	0	0	0	0	0	0	0	0	9917
Ougeinia dalbergoiides	653	89006	9917	9917	0	0	0	0	0	0	0	108715
Phoebe species	673	9917	0	0	0	0	0	0	0	0	0	9917
Pterocarpus marsupium	722	296520	79088	9917	0	0	0	0	0	0	0	385527
Schleichera trijuga	795	89006	49461	9917	0	0	0	9917	0	0	0	158177
Semecarpus anacardium	798	494243	29626	0	0	0	0	0	0	0	0	523870

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Cont. of Table No.2.2

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Shorea robusta	802	6622883	1008195	612876	197722	19709	0	0	0	0	0	8461385
Soymida febrifuga	809	29626	0	0	0	0	0	0	0	0	0	29626
Spondias pinnata	812	9917	0	0	0	0	0	0	0	0	0	9917
Sterculia villosa	821	9917	9917	0	0	0	0	0	0	0	0	19709
Strychnos potatorum	832	39544	0	0	0	0	0	0	0	0	0	39544
Syzygium cumini	843	158177	128550	9917	9917	0	0	0	0	0	0	306430
Syzygium species	850	9917	0	0	0	0	0	0	0	0	0	9917
Tectona grandis	858	49461	0	0	0	0	0	0	0	0	0	49461
Terminalia belerica	861	59253	0	9917	0	0	0	0	0	0	0	69171
Terminalia chebula	864	148260	9917	0	0	0	0	0	0	0	0	158177
Terminalia citrina	865	9917	0	0	19709	0	0	0	0	0	0	29626
Terminalia crenulata	866	1107119	187804	39544	9917	0	0	0	0	0	0	1344384
Weichtia tinctoria	910	9917	0	0	0	0	0	0	0	0	0	9917
Zizyphus glabrata	926	39544	0	0	0	0	0	0	0	0	0	39544
Zizyphus mauritiana	927	19709	0	0	0	0	0	0	0	0	0	19709
Zizyphus species	930	49461	9917	0	0	0	0	0	0	0	0	59253
Unidentified trees	944	978568	49461	0	29626	0	0	0	0	0	0	1057657
TOTAL		16873435	2797363	948941	385527	49461	19709	9917	19709	19709	0	21123[illegible]

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TABLE NO.2.3

TOTAL STEMS(IN NO.) BY SPECIES AND DIAMETER CLASSES(IN CM.)

DISTRICT-SHINGDUM STRATA:PLANTATION FOREST

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Albizzia species	51	19761	0	0	0	0	0	0	0	0	0	19761
Anacardium occidentale	66	88968	29663	9880	0	0	0	0	0	0	0	128472
Bombax ceiba	131	9880	0	0	0	0	0	0	0	0	0	9880
Bridelia retusa	138	98849	0	0	0	0	0	0	0	0	0	98849
Buchanania lanzan	143	9880	0	9880	0	0	0	0	0	0	0	19761
Butea monosperma	146	9880	0	0	0	0	0	0	0	0	0	9880
Dalbergia latifolia	266	19761	0	0	0	0	0	0	0	0	0	19761
Diospyros melanoxylon	285	0	0	39543	0	0	0	0	0	0	0	39543
Ficus bengalensis	375	0	0	0	0	0	0	0	9880	0	0	9880
Garuga pinnata	407	9880	0	0	0	0	0	0	0	0	0	9880
Grewia microcos	428	59305	0	0	0	0	0	0	0	0	0	59305
Madhuca latifolia	561	9880	19761	0	9880	9880	9880	0	9880	0	0	69186
Shorea robusta	902	9880	0	0	0	0	0	0	0	0	0	9880
Syzygium cumini	843	19761	0	9880	0	0	0	0	0	0	0	29663
Tectona grandis	858	207580	0	0	0	0	0	0	0	0	0	207580
Terminalia chebula	864	0	0	0	9880	0	0	0	0	0	0	9880
Terminalia crenulata	866	0	9880	0	0	0	0	0	0	0	0	9880
Unidentified trees	944	29663	0	0	0	0	0	0	0	0	0	29663
Acacia Auriculiformis(A06)	A06	29663	0	0	0	0	0	0	0	0	0	29663
TOTAL		632520	59305	69186	19761	9880	9880	0	19761	0	0	820493

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TABLE NO.3.1

VOLUME(IN M^3) PER HECTARE BY SPECIES AND DIAMETERCLASSES(IN CM.)

DISTRICT- SINGBHUM STRATA-HIGH FOREST

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	T[illegible]
Acer laevigatum	17	.023	.000	.000	.000	.000	.000	.000	.000	.000	.000	[illegible]
Adina cordifolia	28	.268	.231	.280	.774	.000	.000	.305	.000	.000	.000	1.[illegible]
Adina oligocephala	30	.000	.000	.000	.000	.087	.000	.000	.000	.000	.000	.0[illegible]
Aegle marmelos	32	.059	.014	.000	.000	.000	.000	.000	.000	.000	.000	.[illegible]
Albizzia procera	50	.009	.070	.079	.000	.000	.000	.000	.000	.000	.000	[illegible]
Albizzia species	51	.108	.029	.088	.047	.000	.000	.000	.000	.000	.000	.2[illegible]
Amoora species	65	.000	.012	.000	.000	.000	.000	.000	.000	.000	.000	.0[illegible]
Anogeissus acuminata	71	.004	.000	.000	.000	.000	.000	.000	.000	.000	.000	.004
Anogeissus latifolia	72	1.258	1.865	1.486	.796	.253	.000	.000	.000	.000	.000	5.649
Aphanamixis polystachya	80	.004	.000	.000	.000	.000	.000	.000	.000	.000	.000	.004
Azadirachta indica	103	.016	.000	.000	.000	.000	.000	.000	.000	.000	.000	.0[illegible]
Bauhinia purpurea	114	.017	.000	.000	.000	.000	.000	.000	.000	.000	.000	.017
Bauhinia retusa	116	.007	.000	.000	.000	.000	.000	.000	.000	.000	.000	.007
Bauhinia species	118	.177	.098	.030	.197	.000	.000	.000	.000	.000	.000	.503
Bombax ceiba	131	.009	.000	.122	.000	.000	.000	.000	.000	.000	.000	.13[illegible]
Boswellia serrata	133	.059	.169	.361	.356	.000	.000	.000	.000	.000	.000	.945
Bridelia retusa	138	.240	.243	.123	.155	.081	.000	.000	.000	.000	.000	.841
Buchanania lanzan	143	1.020	.569	.196	.088	.000	.000	.000	.000	.000	.000	1.872
Butea monosperma	146	.042	.072	.105	.000	.000	.000	.000	.000	.000	.000	.2[illegible]
Callicarpa arborea	150	.003	.000	.000	.000	.000	.000	.000	.000	.000	.000	.003
Canarium species	168	.002	.000	.000	.000	.000	.000	.000	.000	.000	.000	.002
Careya arborea	177	.008	.047	.000	.000	.000	.000	.000	.000	.000	.000	.055
Cassia fistula	186	.044	.012	.038	.000	.000	.000	.000	.000	.000	.000	.094
Cedrela serrata	197	.021	.030	.000	.000	.000	.000	.000	.000	.000	.000	.052
Toona ciliata	198	.028	.085	.000	.000	.000	.000	.000	.000	.000	.000	.113
Chloroxylon swietenia	206	.010	.000	.036	.000	.000	.000	.000	.000	.000	.000	.046
Chukrasia vellutina	208	.004	.034	.000	.050	.000	.000	.000	.000	.000	.000	.08[illegible]
Cleistanthus collinus	218	.388	.072	.000	.000	.000	.000	.000	.000	.000	.000	.460
Dalbergia latifolia	266	.004	.000	.000	.000	.000	.000	.000	.000	.000	.000	.004
Dalbergia sissoo	268	.003	.000	.000	.000	.000	.000	.000	.000	.000	.000	.003

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Cont. of Table No.3.1

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Dillenia pentagyna	278	.020	.041	.083	.000	.000	.000	.000	.000	.000	.000	.144
Diospyros melanoxylon	285	.317	.476	.376	.252	.153	.000	.000	.000	.000	.000	1.574
Diospyros species	292	.002	.029	.028	.000	.000	.000	.000	.000	.000	.000	.059
Duabanga grandiflora	303	.004	.000	.000	.000	.000	.000	.000	.000	.000	.000	.004
Emblica officinalis	325	.043	.018	.000	.000	.000	.000	.000	.000	.000	.000	.060
Endospermum chinense	326	.013	.009	.000	.000	.000	.000	.000	.000	.000	.000	.022
Erythrina variegata	341	.036	.068	.000	.000	.000	.000	.000	.000	.000	.000	.104
Erythrina species	342	.005	.032	.000	.047	.000	.000	.000	.000	.000	.000	.085
Ficus religiosa	381	.002	.022	.000	.000	.000	.000	.000	.000	.000	.000	.024
Ficus recemosa	382	.008	.028	.000	.000	.000	.000	.000	.000	.000	.000	.036
Ficus species	385	.011	.075	.040	.000	.084	.000	.000	.000	.246	.000	.457
Flacourtia species	391	.029	.000	.000	.000	.000	.000	.000	.000	.000	.000	.029
Gardenia resinifera	405	.039	.102	.030	.000	.000	.000	.000	.000	.000	.000	.171
Garuga pinnata	407	.045	.061	.000	.000	.000	.000	.000	.000	.000	.000	.107
Gmelina arborea	420	.056	.081	.082	.058	.069	.000	.000	.000	.000	.000	.345
Grewia microcos	428	.014	.009	.000	.000	.000	.000	.000	.000	.000	.000	.023
Grewia tiliaefolia	431	.003	.000	.000	.000	.000	.000	.000	.000	.000	.000	.003
Grewia species	432	.009	.000	.000	.000	.000	.000	.000	.000	.000	.000	.009
Holarrhena antidysenterica	452	.041	.019	.000	.000	.000	.000	.000	.000	.000	.000	.061
Holoptelea integrifolia	456	.016	.000	.023	.000	.000	.000	.000	.000	.000	.000	.039
Hymenodictyon excelsum	470	.014	.000	.000	.000	.000	.000	.000	.000	.000	.000	.014
Kydia calycina	501	.079	.054	.038	.052	.000	.000	.000	.000	.000	.000	.224
Lagerstroemia lanceolata	504	.004	.000	.000	.000	.000	.000	.000	.000	.000	.000	.004
Lagerstroemia parviflora	505	.129	.063	.068	.000	.000	.000	.000	.000	.000	.000	.260
Lannea coromandelica	509	.531	.521	.308	.197	.160	.000	.000	.000	.000	.000	1.719
Lindera nessiana	521	.003	.000	.000	.000	.000	.000	.000	.000	.000	.000	.003
Machilus parviflora	557	.002	.000	.000	.000	.000	.000	.000	.000	.000	.000	.002
Madhuca latifolia	561	.240	.553	.262	.262	.147	.340	.000	.000	.000	.000	1.805
Mallotus philippinensis	565	.013	.019	.000	.000	.000	.000	.000	.000	.000	.000	.032
Mangifera indica	569	.011	.025	.028	.102	.000	.000	.000	.199	.000	.000	.365
Melioma species	589	.000	.012	.000	.000	.000	.000	.000	.000	.000	.000	.012
Memecylon angustifolium	590	.002	.000	.000	.000	.000	.000	.000	.000	.000	.000	.002

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Cont. of Table No.3.1

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOT
Mitragyna parviflora	611	.034	.030	.000	.050	.000	.000	.000	.000	.000	.000	[illegible]
Morinda tinctoria	613	.009	.000	.000	.000	.000	.000	.000	.000	.000	.000	[illegible]
Nyctanthes arbortristis	637	.008	.000	.000	.000	.000	.000	.000	.000	.000	.000	[illegible]
Ougeinia dalbergoides	653	.059	.030	.052	.000	.000	.000	.000	.000	.000	.000	[illegible]
Pongamia pinnata	701	.019	.000	.000	.000	.000	.000	.000	.000	.000	.000	[illegible]
Pterocarpus marsupium	722	.223	.201	.21[illegible]	.150	.084	.000	.000	.000	.000	.000	[illegible]
Pterospermum acerifolium	725	.014	.000	.000	.000	.000	.000	.000	.000	.000	.000	[illegible]
Pterospermum species	731	.004	.011	.000	.000	.000	.000	.000	.000	.000	.000	[illegible]
Saccopetalum tomentosum	770	.003	.000	.000	.000	.000	.000	.000	.000	.000	.000	[illegible]
Schleichera trijuga	795	.032	.082	.183	.060	.072	.000	.000	.000	.000	.000	[illegible]
Schrebera swienteniodes	796	.021	.021	.000	.000	.000	.000	.000	.000	.000	.000	[illegible]
Semecarpus anacardium	798	.216	.152	.023	.000	.000	.000	.000	.000	.000	.000	[illegible]
Semecarpus kurzii	799	.015	.000	.000	.000	.000	.000	.000	.000	.000	.000	[illegible]
Shorea robusta	802	3.997	5.421	6.390	5.960	2.088	.273	.347	.000	.000	.000	24.4[illegible]
Soymida febrifuga	809	.020	.000	.000	.000	.000	.000	.000	.000	.000	.000	[illegible]
Spondias pinnata	812	.016	.020	.000	.000	.000	.000	.000	.000	.000	.000	[illegible]
Sterculia villosa	821	.096	.035	.023	.113	.000	.000	.000	.000	.000	.000	[illegible]
Stereospermum personatum	824	.000	.019	.000	.000	.000	.000	.000	.000	.000	.000	[illegible]
Strychnos potatorum	832	.004	.000	.000	.000	.000	.000	.000	.000	.000	.000	[illegible]
Syzygium cumini	843	.162	.120	.069	.042	.000	.000	.000	.000	.000	.000	.359
Syzygium species	850	.078	.068	.053	.066	.000	.000	.000	.000	.000	.000	.264
Tabernaemontanadichotama	852	.000	.011	.000	.000	.000	.000	.000	.000	.000	.000	[illegible]
Terminalia arjuna	860	.000	.000	.106	.000	.098	.136	.148	.000	.000	.000	.487
Terminalia belerica	861	.067	.055	.064	.000	.000	.000	.000	.000	.000	.000	.186
Terminalia chebula	864	.087	.065	.000	.000	.000	.000	.000	.000	.000	.000	.152
Terminalia citrina	865	.014	.000	.000	.000	.000	.000	.000	.000	.000	.000	[illegible]
Terminalia crenulata	866	1.197	1.241	.953	.720	.221	.140	.000	.000	.000	.000	4.473
Trewia nudiflora	880	.006	.000	.000	.000	.000	.000	.000	.000	.000	.000	.006
Ulmus lanifolia	886	.002	.016	.000	.000	.000	.000	.000	.000	.000	.000	.018
Wrightia tomentosa	912	.002	.000	.000	.000	.000	.000	.000	.000	.000	.000	.002
Xylia xylocarpa	919	.003	.000	.000	.000	.000	.000	.000	.000	.000	.000	.003
Zizyphus xylopyra	929	.020	.000	.000	.000	.000	.000	.000	.000	.000	.000	.020
Zizyphus species	930	.066	.020	.000	.000	.000	.000	.000	.000	.000	.000	.086
Unidentified trees	944	1.401	.567	.328	.148	.000	.000	.000	.000	.000	.000	2.445
TOTAL		13.435	14.161	12.763	10.734	3.596	.890	.800	.199	.246	.000	56.324

TABLE NO.3.2

VOLUME(IN M^3) PER HECTARE BY SPECIES AND DIAMETERCLASSES(IN CM.)

DISTRICT- SIKKIM STRATA-COPPICE FOREST

TREES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Acer campbellii	20	.000	.252	.000	.000	.000	.000	.000	.000	.000	.000	.252
Aesculus assamica	32	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Alnus nepalensis	50	.024	.015	.000	.000	.000	.000	.000	.000	.000	.000	.039
Alnus species	51	.015	.000	.000	.000	.000	.000	.000	.000	.000	.000	.015
Amoora wallichii	72	.310	.794	.062	.000	.000	.351	.000	.000	.000	.000	1.517
Anogeissus latifolia	103	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Bauhinia retusa	116	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Bauhinia species	118	.000	.015	.000	.000	.000	.000	.000	.000	.000	.000	.015
Bombax ceiba	131	.000	.023	.000	.000	.000	.000	.000	.355	.401	.000	.779
Boswellia serrata	133	.191	.130	.000	.244	.000	.000	.000	.000	.000	.000	.555
Bombelia retusa	138	.000	.177	.065	.000	.000	.000	.000	.000	.000	.000	.242
Buchanania lanzan	143	1.177	.719	.213	.000	.000	.000	.000	.000	.000	.000	2.177
Callicarpa arborea	150	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Carpinus viminea	177	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Cassia fistula	186	.000	.023	.000	.000	.000	.000	.000	.000	.000	.000	.023
Cassia species	189	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Castanopsis tribuloides	218	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Castanopsis indica	223	.000	.021	.000	.000	.000	.000	.000	.000	.000	.000	.021
Dalbergia latifolia	266	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Dillenia centrogyna	278	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Dipterocarpus grandiflora	282	.035	.000	.000	.000	.000	.000	.000	.000	.000	.000	.035
Dipterocarpus tuberculatus	285	.377	.335	.377	.349	.000	.000	.000	.000	.000	.000	1.438
Dipterocarpus species	292	.031	.000	.000	.000	.000	.000	.000	.000	.000	.000	.031
Emblica officinalis	325	.013	.000	.000	.000	.000	.000	.000	.000	.000	.000	.013
Erythrina variegata	341	.030	.031	.000	.000	.000	.000	.000	.000	.000	.000	.061
Erythrina species	342	.003	.000	.000	.000	.000	.000	.000	.000	.000	.000	.003
Eugenia cumosa	350	.009	.000	.000	.000	.000	.000	.000	.000	.000	.000	.009
Eugenia grandis	353	.003	.000	.000	.000	.000	.000	.000	.000	.000	.000	.003
Eugenia species	358	.009	.000	.000	.000	.000	.000	.000	.000	.000	.000	.009

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Cont. of Table No.3.2

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Ficus bengalensis	375	.008	.000	.000	.000	.000	.172	.000	.000	.000	.000	.180
Ficus recemosa	382	.000	.032	.048	.000	.000	.000	.000	.000	.000	.000	.080
Ficus, species	385	.043	.019	.058	.000	.000	.000	.000	.000	.000	.000	.119
Flacourtia species	391	.022	.000	.000	.000	.000	.000	.000	.000	.000	.000	.022
Gardenia resinifera	405	.032	.000	.039	.000	.000	.000	.000	.000	.000	.000	.071
Garuga pinnata	407	.032	.084	.039	.000	.000	.000	.000	.000	.000	.000	.155
Gmelina arborea	420	.086	.089	.000	.000	.166	.000	.000	.000	.000	.000	.342
Grewia microcos	428	.006	.000	.000	.000	.000	.000	.000	.000	.000	.000	.006
Grewia tiliaefolia	431	.013	.000	.000	.000	.000	.000	.000	.000	.000	.000	.013
Hollarrhena antidysenterica	452	.005	.000	.000	.000	.000	.000	.000	.000	.000	.000	.005
Hopea odorata	459	.000	.036	.000	.000	.000	.000	.000	.000	.000	.000	.036
Hydia calycina	501	.010	.000	.000	.000	.000	.000	.000	.000	.000	.000	.010
Lagerstroemia parviflora	505	.058	.052	.000	.000	.000	.000	.000	.000	.000	.000	.110
Lannea coromandelica	509	.269	.052	.000	.000	.000	.000	.000	.000	.000	.000	.320
Melhuca latifolia	531	.176	.154	.249	.240	.122	.000	.000	.000	.438	.000	.480
Mangifera indica	539	.003	.000	.096	.000	.154	.000	.000	.356	.000	.000	.609
Mitrefusa tomentosa	625	.010	.000	.000	.000	.000	.000	.000	.000	.000	.000	.010
Mitragyna parviflora	611	.005	.000	.048	.000	.000	.000	.000	.000	.000	.000	.053
Morinda tinctoria	713	.007	.000	.000	.000	.000	.000	.000	.000	.000	.000	.007
Nyctanthes arbortristis	637	.003	.000	.000	.000	.000	.000	.000	.000	.000	.000	.003
Ougeinia dalbergoiides	653	.061	.019	.054	.000	.000	.000	.000	.000	.000	.000	.134
Persea species	673	.004	.000	.000	.000	.000	.000	.000	.000	.000	.000	.004
Pterocarpus marsupium	722	.206	.176	.051	.000	.000	.000	.000	.000	.000	.000	.433
Schleichera trijuga	735	.070	.118	.065	.000	.000	.000	.259	.000	.000	.000	.512
Symplocus cochinchinensis	739	.256	.074	.000	.000	.000	.000	.000	.000	.000	.000	.330

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Cont. of Table No.3.2

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Shorea robusta	802	2.190	1.850	2.411	1.054	.203	.000	.000	.000	.000	.000	9.008
Soymida febrifuga	809	.020	.000	.000	.000	.000	.000	.000	.000	.000	.000	.020
Sterculia pinnata	812	.003	.000	.000	.000	.000	.000	.000	.000	.000	.000	.003
Sterculia villosa	821	.004	.015	.000	.000	.000	.000	.000	.000	.000	.000	.020
Strychnos potatorum	832	.019	.000	.000	.000	.000	.000	.000	.000	.000	.000	.019
Syzygium cumini	843	.099	.222	.054	.083	.000	.000	.000	.000	.000	.000	.457
Syzygium species	850	.005	.000	.000	.000	.000	.000	.000	.000	.000	.000	.005
Tectona grandis	858	.017	.000	.000	.000	.000	.000	.000	.000	.000	.000	.017
Terminalia belerica	861	.028	.000	.042	.000	.000	.000	.000	.000	.000	.000	.070
Terminalia chebula	864	.086	.015	.000	.000	.000	.000	.000	.000	.000	.000	.101
Terminalia citrina	865	.003	.000	.000	.161	.000	.000	.000	.000	.000	.000	.164
Terminalia crenulata	866	.728	.478	.224	.105	.000	.000	.000	.000	.000	.000	1.535
Wrightia tinctoria	910	.003	.000	.000	.000	.000	.000	.000	.000	.000	.000	.003
Zizyphus glabrata	926	.021	.000	.000	.000	.000	.000	.000	.000	.000	.000	.021
Zizyphus mauritiana	927	.010	.000	.000	.000	.000	.000	.000	.000	.000	.000	.010
Zizyphus species	930	.022	.028	.000	.000	.000	.000	.000	.000	.000	.000	.050
Unidentified trees	944	.510	.101	.000	.261	.000	.000	.000	.000	.000	.000	.872
TOTAL		9.512	6.152	4.197	3.079	.645	.503	.259	.712	.839	.000	25.917

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TABLE NO.3.3.

VOLUME(IN M^3) PER HECTARE BY SPECIES AND DIAMETERCLASSES(IN CM.)

DISTRICT- SINGBHUM STRATA--PLANTATION

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Albizzia species	51	.062	.000	.000	.000	.000	.000	.000	.000	.000	.000	.062
Anacardium occidentale	66	.289	.363	.269	.000	.000	.000	.000	.000	.000	.000	.921
Bombax ceiba	131	.039	.000	.000	.000	.000	.000	.000	.000	.000	.000	.039
Bridelia retusa	138	.347	.000	.000	.000	.000	.000	.000	.000	.000	.000	.347
Buchanania lanzan	143	.021	.000	.269	.000	.000	.000	.000	.000	.000	.000	.290
Butea monosperma	146	.046	.000	.000	.000	.000	.000	.000	.000	.000	.000	.046
Dalbergia latifolia	266	.047	.000	.000	.000	.000	.000	.000	.000	.000	.000	.047
Diospyros melanoxylon	285	.000	.000	1.488	.000	.000	.000	.000	.000	.000	.000	1.488
Ficus bengalensis	375	.000	.000	.000	.000	.000	.000	.000	1.898	.000	.000	1.898
Garuga pinnata	407	.026	.000	.000	.000	.000	.000	.000	.000	.000	.000	.026
Grewia microcos	428	.163	.000	.000	.000	.000	.000	.000	.000	.000	.000	.163
Madhuca latifolia	561	.046	.320	.000	.565	.738	1.271	.000	2.049	.000	.000	4.988
Shorea robusta	802	.019	.000	.000	.000	.000	.000	.000	.000	.000	.000	.019
Syzygium cumini	843	.027	.000	.219	.000	.000	.000	.000	.000	.000	.000	.246
Tectona grandis	858	.550	.000	.000	.000	.000	.000	.000	.000	.000	.000	.550
Terminalia chebula	864	.000	.000	.000	.677	.000	.000	.000	.000	.000	.000	.677
Terminalia crenulata	866	.000	.125	.000	.000	.000	.000	.000	.000	.000	.000	.125
Acacia Auriculiformis(A06)	943	.110	.000	.000	.000	.000	.000	.000	.000	.000	.000	.110
Unidentified trees	944	.067	.000	.000	.000	.000	.000	.000	.000	.000	.000	.067
TOTAL		1.858	.809	2.246	1.242	.738	1.271	.000	3.946	.000	.000	12.109

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TABLE NO 4.1

TOTAL VOLUME(IN M^3) BY SPECIES AND DIAMETER CLASSES(IN CM.)

STRATA-:HIGH FOREST DISTRICT: SHINGBHUM

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Acer laevigatum	17	4910	0	0	0	0	0	0	0	0	0	4910
Adina cordifolia	28	56794	49321	59783	165259	0	0	65121	0	0	0	336480
Adina oligocephala	30	0	0	0	0	18575	0	0	0	0	0	18575
Aegle marmelos	32	12597	2989	0	0	0	0	0	0	0	0	15586
Albizzia procera	50	1921	14945	16867	0	0	0	0	0	0	0	33521
Albizzia species	51	23059	6191	18789	10035	0	0	0	0	0	0	58289
Amoora species	65	0	2562	0	0	0	0	0	0	0	0	2562
Anogeissus acuminata	71	854	0	0	0	0	0	0	0	0	0	854
Anogeissus latifolia	72	268599	398201	317280	167821	54018	0	0	0	0	0	1205921
Aphanamixis polystachya	80	854	0	0	0	0	0	0	0	0	0	854
Azadirachta indica	103	3416	0	0	0	0	0	0	0	0	0	3416
Bauhinia purpurea	114	3629	0	0	0	0	0	0	0	0	0	3629
Bauhinia retusa	116	1494	0	0	0	0	0	0	0	0	0	1494
Bauhinia species	118	37791	20924	6405	42062	0	0	0	0	0	0	107397
Bombax ceiba	131	1921	0	26048	0	0	0	0	0	0	0	27970
Boswellia serrata	133	12597	36083	77078	76010	0	0	0	0	0	0	201769
Bridelia retusa	138	51243	51883	26262	33094	17294	0	0	0	0	0	179564
Buchanania lanzan	143	217783	121488	41848	18789	0	0	0	0	0	0	399696
Butea monosperma	146	8967	15372	22418	0	0	0	0	0	0	0	46545
Callicarpa arborea	150	640	0	0	0	0	0	0	0	0	0	640
Canarium species	168	427	0	0	0	0	0	0	0	0	0	427
Careya arborea	177	1708	10035	0	0	0	0	0	0	0	0	11743
Cassia fistula	186	9394	2562	8113	0	0	0	0	0	0	0	20070
Cedrela serrata	197	4483	6405	0	0	0	0	0	0	0	0	11102
Toona ciliata	198	5978	18148	0	0	0	0	0	0	0	0	24126
Chloroxylon swietenia	206	2135	0	7686	0	0	0	0	0	0	0	9821
Chukrasia vellutina	208	854	7259	0	10675	0	0	0	0	0	0	19002

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Cont. of Table No.4.1

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Cleistanthus collinus	218	82843	15372	0	0	0	0	0	0	0	0	982 5
Dalbergia latifolia	266	854	0	0	0	0	0	0	0	0	0	854
Dalbergia sissoo	268	640	0	0	0	0	0	0	0	0	0	640
Dillenia pentagyna	278	4270	8754	17721	0	0	0	0	0	0	0	30745
Diospyros melanoxylon	285	67693	101632	80280	53805	32667	0	0	0	0	0	336083
Diospyros species	292	427	6191	5978	0	0	0	0	0	0	0	12303
Duabanga grandiflora	303	854	0	0	0	0	0	0	0	0	0	854
Emblica officinalis	325	9181	3416	0	0	0	0	0	0	0	0	128 0
Endospermum chinense	326	2775	1921	0	0	0	0	0	0	0	0	4697
Erythrina variegata	341	7686	14518	0	0	0	0	0	0	0	0	22205
Erythrina species	342	1067	6832	0	10035	0	0	0	0	0	0	18148
Ficus religiosa	381	427	4697	0	0	0	0	0	0	0	0	5124
Ficus racemosa	382	1708	5978	0	0	0	0	0	0	0	0	7686
Ficus species	385	2343	16013	8540	0	17935	0	0	0	52524	0	97575
Flacourtia species	391	6191	0	0	0	0	0	0	0	0	0	6191
Gardenia resinifera	405	8327	21778	6405	0	0	0	0	0	0	0	36510
Garuga pinnata	407	9608	13024	0	0	0	0	0	0	0	0	22845
Gmelina arborea	420	11956	17294	17508	12383	14732	0	0	0	0	0	73661
Grewia microcos	428	2989	1921	0	0	0	0	0	0	0	0	4910
Grewia tiliaefolia	431	640	0	0	0	0	0	0	0	0	0	640
Grewia species	432	1921	0	0	0	0	0	0	0	0	0	1921
Hollarrhena antidysenterica	452	8754	4056	0	0	0	0	0	0	0	0	13024
Holoptelea integrifolia	456	3416	0	4910	0	0	0	0	0	0	0	8327
Hymenodictyon excelsum	470	2989	0	0	0	0	0	0	0	0	0	2989
Kydia calycina	501	16867	11529	8113	11102	0	0	0	0	0	0	47826
Lagerstroemia lanceolata	504	854	0	0	0	0	0	0	0	0	0	854
Lagerstroemia parviflora	505	27543	13451	14518	0	0	0	0	0	0	0	55513
Lannea coromandelica	509	113375	111240	65762	42062	34162	0	0	0	0	0	366388
Lindera nessiana	521	640	0	0	0	0	0	0	0	0	0	640
Machiulus parviflora	557	427	0	0	0	0	0	0	0	0	0	427

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Cont. of Table No.4.1

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Madhuca latifolia	561	51243	118072	55940	55940	31386	72594	0	0	0	0	385390
Mallotus philippinensis	565	2775	4056	0	0	0	0	0	0	0	0	6832
Mangifera indica	569	2348	5337	5978	21778	0	0	0	42489	0	0	78145
Meliosma species	589	0	2562	0	0	0	0	0	0	0	0	2562
Memecylon angustifolium	590	427	0	0	0	0	0	0	0	0	0	427
Mitragyna parviflora	611	7259	6405	0	10675	0	0	0	0	0	0	24340
Morinda tinctoria	613	1921	0	0	0	0	0	0	0	0	0	1921
Nyctanthes arbortristis	637	1708	0	0	0	0	0	0	0	0	0	1708
Ougeinia dalbergoiides	653	12597	6405	11102	0	0	0	0	0	0	0	30105
Pongamia pinnata	701	4056	0	0	0	0	0	0	0	0	0	4056
Pterocarpus marsupium	722	47613	42916	44837	32026	17935	0	0	0	0	0	185329
Pterospermum acerifolium	725	2989	0	0	0	0	0	0	0	0	0	2989
Pterospermum species	731	854	2348	0	0	0	0	0	0	0	0	3202
Saccopetalum tomentosum	770	640	0	0	0	0	0	0	0	0	0	640
Schleichera trijuga	795	6832	17508	39072	12810	15372	0	0	0	0	0	91810
Schrebera swietenioides	796	4483	4483	0	0	0	0	0	0	0	0	9181
Semecarpus anacardium	798	46118	32453	4910	0	0	0	0	0	0	0	83483
Semecarpus kurzii	799	3202	0	0	0	0	0	0	0	0	0	3202
Shorea robusta	802	853411	1157454	1364348	1272537	445815	58289	74089	0	0	0	5225944
Soymida febrifuga	809	4270	0	0	0	0	0	0	0	0	0	4270
Spondias pinnata	812	3416	4270	0	0	0	0	0	0	0	0	7686
Sterculia villosa	821	14091	7472	4910	24126	0	0	0	0	0	0	50602
Stereospermum personatum	824	0	4056	0	0	0	0	0	0	0	0	4056
Strychnos potatorum	832	854	0	0	0	0	0	0	0	0	0	854
Syzygium cumini	843	34589	25621	14732	8967	0	0	0	0	0	0	83910
Syzygium species	850	16654	14518	11316	14091	0	0	0	0	0	0	56367
Tabernaemontanadichotama	852	0	2348	0	0	0	0	0	0	0	0	2348
Terminalia arjuna	860	0	0	22632	0	20924	29037	31599	0	0	0	103980
Terminalia belerica	861	14305	11743	13664	0	0	0	0	0	0	0	39713

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Cont. of Table No.4.1

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Terminalia chebula	864	18575	13878	0	0	0	0	0	0	0	0	32453
Terminalia citrina	865	2989	0	0	0	0	0	0	0	0	0	2989
Terminalia crenulata	866	255575	264969	203477	153729	47186	29891	0	0	0	0	955043
Trewia nudiflora	880	1281	0	0	0	0	0	0	0	0	0	1281
Ulmus lancifolia	886	427	3416	0	0	0	0	0	0	0	0	3843
Wriantia tomentosa	912	427	0	0	0	0	0	0	0	0	0	427
Xylia xylocarpa	919	640	0	0	0	0	0	0	0	0	0	640
Zizyphus zylopyra	929	4270	0	0	0	0	0	0	0	0	0	4270
Zizyphus species	930	14091	4270	0	0	0	0	0	0	0	0	18362
Unidentified trees	944	299131	121061	70032	31599	0	0	0	0	0	0	522039
TOTAL		2868547	3023557	2725066	2291848	767792	190926	170810	42439	52524	0	12132663

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TABLE NO.4.2

TOTAL VOLUME(IN M^3) BY SPECIES AND DIAMETER CLASSES(IN CM.)

STRATA-:COPPICE FOREST DISTRICT: SHINGBHUM

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Adina cordifolia	28	12428	31635	0	0	0	0	0	0	0	0	44189
Aegle marmelos	32	3766	0	0	0	0	0	0	0	0	0	3766
Albizzia procera	50	3012	1883	0	0	0	0	0	0	0	0	5021
Albizzia species	51	1883	0	0	0	0	0	0	0	0	0	1883
Anogeissus latifolia	72	101685	99677	7783	0	0	44063	0	0	0	0	253210
Azadirachta indica	103	1004	0	0	0	0	0	0	0	0	0	1004
Bauhinia retusa	116	376	0	0	0	0	0	0	0	0	0	376
Bauhinia species	118	8830	1883	0	0	0	0	0	0	0	0	20839
Bombax ceiba	131	753	2887	0	0	0	0	0	44691	50340	0	98672
Boswellia serrata	133	22722	16319	0	30631	0	0	0	0	0	0	69673
Bridelia retusa	138	10168	22220	8159	0	0	0	0	0	0	0	40548
Buchanania lanzan	143	145498	90261	27367	10168	0	0	0	0	0	0	273295
Callicarpa arborea	150	627	0	0	0	0	0	0	0	0	0	627
Careya arborea	177	1506	0	0	0	0	0	0	0	0	0	1506
Casearia tubescens	182	753	0	0	0	0	0	0	0	0	0	753
Cassia fistula	186	4393	2887	0	0	0	0	0	0	0	0	7281
Casia species	189	2259	0	0	0	0	0	0	0	0	0	2259
Cleistanthus collinus	218	10670	0	0	0	0	0	0	0	0	0	10670
Cochlospermum religiosum	223	13934	2636	0	0	0	0	0	0	0	0	16571
Dalbergia latifolia	266	1129	0	0	0	0	0	0	0	0	0	1129
Dillenia pentagyna	278	878	0	0	12302	0	0	0	0	0	0	13181
Diospyros chumenta	282	627	0	0	0	0	0	0	0	0	0	627
Diospyros melanoxylon	285	46323	42055	47327	43687	0	0	0	0	0	0	179393
Diospyros species	292	3891	0	0	0	0	0	0	0	0	0	3891

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Cont. of Table No.4.2

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Emblica officinalis	325	1631	0	0	0	0	0	0	0	0	0	1631
Erythrina variegata	341	3766	3891	0	0	0	0	0	0	0	0	7657
Erythrina species	342	376	0	0	0	0	0	0	0	0	0	376
Eugenia cumosa	350	1129	0	0	0	0	0	0	0	0	0	1129
Eugenia grandis	353	376	0	0	0	0	0	0	0	0	0	376
Eugenia species	358	4770	0	0	0	0	0	0	0	0	0	4770
Ficus bengalensis	375	1004	0	0	0	0	21592	0	0	0	0	22596
Ficus racemosa	382	0	4017	6025	0	0	0	0	0	0	0	10043
Ficus species	385	5398	2385	7281	0	0	0	0	0	0	0	14939
Flacourtia species	391	2761	0	0	0	0	0	0	0	0	0	2761
Gardenia resinifera	405	4017	0	4895	0	0	0	0	0	0	0	8913
Garuga pinnata	407	4017	10545	4895	0	0	0	0	0	0	0	19458
Gmelina arborea	420	10796	11172	0	0	20839	0	0	0	0	0	42808
Grewia microcos	428	753	0	0	0	0	0	0	0	0	0	753
Grewia tiliaefolia	431	1631	0	0	0	0	0	0	0	0	0	1631
Hollarrhena antidysenterica	452	627	0	0	0	0	0	0	0	0	0	627
Hopea odorata	459	0	4519	0	0	0	0	0	0	0	0	4519
Kydia calycina	501	1255	0	0	0	0	0	0	0	0	0	1255
Lagerstroemia parviflora	505	7281	6527	0	0	0	0	0	0	0	0	13809
Lannea coromandelica	509	33769	6527	0	0	0	0	0	0	0	0	40172
Madhuca latifolia	561	22094	19332	31258	42682	15315	0	0	0	54985	0	185796
Mangifera indica	569	376	0	12051	0	19332	0	0	44691	0	0	76452
Miliusa tomentosa	605	1255	0	0	0	0	0	0	0	0	0	1255
Mitragyna parviflora	611	627	0	6025	0	0	0	0	0	0	0	6653
Morinda tinctoria	613	878	0	0	0	0	0	0	0	0	0	878
Nyctanthes arbortristis	637	376	0	0	0	0	0	0	0	0	0	376

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Cont. of Table No.4.2

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOTAL
Cupaniopsis calbeorrhides	653	7957	2385	6779	0	0	0	0	0	0	0	17122
Phoenix species	673	502	0	0	0	0	0	0	0	0	0	502
Pterocarpus rotundifolium	722	17210	22094	6402	0	0	0	0	0	0	0	54957
Sterculia trichoga	795	3757	14813	8159	0	0	0	32514	0	0	0	59243
Semecarpus anacardium	798	32137	9289	0	0	0	0	0	0	0	0	41427
Shorea robusta	802	400466	232245	302672	169978	25484	0	0	0	0	0	1130846
Soymida febrifuga	809	2510	0	0	0	0	0	0	0	0	0	2510
Spondias pinnata	812	376	0	0	0	0	0	0	0	0	0	376
Sterculia villosa	821	502	1883	0	0	0	0	0	0	0	0	2510
Strychnos potatorum	832	2385	0	0	0	0	0	0	0	0	0	2385
Syzygium cumini	843	12428	27869	6779	10419	0	0	0	0	0	0	57070
Syzygium species	850	627	0	0	0	0	0	0	0	0	0	627
Tectona grandis	858	2134	0	0	0	0	0	0	0	0	0	2134
Terminalia belerica	861	2515	0	5272	0	0	0	0	0	0	0	8787
Terminalia chebula	864	2796	1883	0	0	0	0	0	0	0	0	12579
Terminalia citrina	865	376	0	0	20211	0	0	0	0	0	0	20588
Terminalia crenulata	866	91391	60007	28120	13181	0	0	0	0	0	0	192700
Weightia tinctoria	910	376	0	0	0	0	0	0	0	0	0	376
Ziziphus glabrata	926	2636	0	0	0	0	0	0	0	0	0	2636
Ziziphus rauratiana	927	1255	0	0	0	0	0	0	0	0	0	1255
Ziziphus species	930	2761	3515	0	0	0	0	0	0	0	0	6276
Unidentified trees	944	44024	12679	0	33016	0	0	0	0	0	0	89594
.TOTAL		1194117	772309	526883	386405	80972	65656	32514	89383	105326	0	3253568

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TABLE NO.4.3

TOTAL VOLUME(IN M^3) BY SPECIES AND DIAMETER CLASSES IN CM.)

STRATA-:PLANTATION FOREST DISTRICT: S INGBHUM

SPECIES NAME	CODE	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	TOT
Albizzia species	51	1286	0	0	0	0	0	0	0	0	0	[illegible]
Anacardium occidentale	56	5999	7535	5583	0	0	0	0	0	0	0	[illegible]
Bombax ceiba	131	809	0	0	0	0	0	0	0	0	0	[illegible]
Bridelia retusa	138	7203	0	0	0	0	0	0	0	0	0	7[illegible]
Buchanania lanzan	143	435	0	5583	0	0	0	0	0	0	0	6[illegible]
Butea monosperma	146	954	0	0	0	0	0	0	0	0	0	[illegible]
Dalbergia latifolia	266	975	0	0	0	0	0	0	0	0	0	[illegible]
Diospyros melanoxylon	285	0	0	30887	0	0	0	0	0	0	0	3[illegible]
Ficus bengalensis	375	0	0	0	0	0	0	0	39398	0	0	39[illegible]
Garuga pinnata	407	539	0	0	0	0	0	0	0	0	0	[illegible]
Grewia microcos	428	3383	0	0	0	0	0	0	0	0	0	[illegible]
Madhuca latifolia	561	954	6642	0	11728	15319	26383	0	42533	0	0	[illegible]
Shorea robusta	802	394	0	0	0	0	0	0	0	0	0	[illegible]
Syzygium cumini	843	560	0	4546	0	0	0	0	0	0	0	5 0[illegible]
Tectona grandis	858	11416	0	0	0	0	0	0	0	0	0	1[illegible]41[illegible]
Terminalia chebula	864	0	0	0	14053	0	0	0	0	0	0	14[illegible]
Terminalia crenulata	866	0	2594	0	0	0	0	0	0	0	0	25[illegible]
Unidentified trees	944	1390	0	0	0	0	0	0	0	0	0	139[illegible]
Acacia Auriculiformis	A06	2283	0	0	0	0	0	0	0	0	0	22[illegible]
TOTAL		38568	16793	46622	25781	15319	26383	0	81911	0	0	251[illegible]

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