# FOREST RESOURCES SURVEY <br> OF SOUTHERTV AND EASTERN RAJASTHAN 

 (Jhunjhunun, Sikar, Alwar. Jaipur, Bharatpur, Sawai Madhopur Tonk, Ajmer, Nati, Bhilwara, Bundi, Kota, Slialawar, Chittaurgarh, Uclaipar (Part), Dungarpur, Banswara, Sirohi, Jalor \& Barmer Districts)( VOLUME- )

## INVENTORY RESULTS

## FOREST RESOURCES SURVEY

 OF SOUTHERN AND EASTERN RAJASTHAN (Jhunjhunun, Sikar, Alwar, Jaipur, Bharatpur, Sawai Madhopur Tonk, Ajmer, Pali, Bhilwara, Bundi, Kota, Jhalawar, Chittaurgarh, Udaipur (Part), Dungarpur. Banswara, Sirohi, Jalor \& Barmer Districts)( Volume-1 )

## INVENTORY RESULTS

FOREST SURVEY OF INDIA NORTHERN ZONE SHIMLA

## PREFACE

This report presents the forest inventory results of Southern and Eastern Rajasthan Comprising of Jhunjhunu, Sikar, Alwar, Jaipur, Bharatpur, Sawai Madhopur, Tonk, Ajmer, Pali, Bhilwara, Bundi, Kota, Jhalawar, Chittaurgarh, Udaipur ( only Bhim Tehsil), Dungarpur, Eanswara, Sirohi, Jalor \& Barmer districts. Field work in this region was carried out during the period 1984 to 1986.

The total geographical area covered under this survey is $1,92,50.8 \mathrm{~km}^{2}$ of which only 9.39 percent (17, 133.32 $\mathrm{km}^{2}$ ) was under farest in 1969 (reference year based on the years of survey of SOI top8sheets). The survey revealed that in 1985, the tree forest extended over only $15150.51 \mathrm{~km}^{2}$. Thus overfapperiod of 16 years ( 1969 to 1985) the State has lataf forest cover over an area of $1882.61 \mathrm{sq} . \mathrm{km} .485 .78^{\circ} \mathrm{km}^{2}$ of forest lands have been reduced to scrub lands or blanks, and $1497.03 \mathrm{~km}^{2}$ has been diverted from forests to non-forestry uses.

Bamboo occurs as an understorey over an area of $529.44 \mathrm{Km}^{2}$, the clumps are however, in very poor shape over an area of $211.776 \mathrm{~km}^{2}$.

On the basis of predominance of soecies and economically four forest types have been identified. These are Teak, Khair, Salai and Mixed spp. forests. Amongst these types, the 'Salai forest' has been essessed to be having the best average stocking of $30.020 \mathrm{~m}^{3}$ per hectare with 249.038 stems per hectare. The lowest average stock per heçtare is for the "Khair forest typer huving anly $3.308 \mathrm{~m}^{3}$ per hectare with 69.392 stems per hectare. The overall average growing stock per hectare is only $10.151 \mathrm{~m}^{3}$ corresponding to 102.270 stems per hectare.

Teak forest type has the highest average canooy density of $49.55 \%$ followed by 39.23 of "Salaith, $34.82 \%$ of "Miscellaneous typet and $14.20 \%$ of "Khair type". The overall average canopy density is $36.6 C$ percent.

The total growing stock standing in the accessible tree forest area has been assessed at 15.20 million cubic metres corresoonding to 153.11 million scems.

The report has been compiled by Shri D.K.Ved, Deputy Director under the guidance of Shri S.C.Joshi, Jaint Director, Forest Survey of India, Northern Zone, Shimla, Sh. Jai Gopal Sharma, JTA has done the tabulation work. It is hoped that the repart will be of use to the state forest departments and other arganisations engaged in the planning and deveíapment of forest resources in the region.

$$
\begin{gathered}
\text { Sd/-Jß, Ľal } \\
\text { Director } \\
\text { Forest Survey of India }
\end{gathered}
$$

TABLE OF CONTENTS

| Summary |  |  | $\begin{equation*} \frac{\text { Page }}{\text { (i) }} \tag{iii} \end{equation*}$ |
| :---: | :---: | :---: | :---: |
| Chapter I | THE B | ACKGROUND |  |
|  | 1.1 | Introduction | 1 |
|  | 1.2 | Location and Boundarles | 2 |
|  | 1.3 | Climate |  |
|  | 1.4 | Fhysical features | 2-3 |
|  | 1.5 | Socio-economic conditions of the people | 3 |
|  | 1.6 | Forests | 4 |
| Chapter 2 | DESIGN AND METHODOLOGY OF THE SURVEY |  |  |
|  | 2.1 | Design and methodology of the survey | 9 |
|  | 2.2 | Definition of forest area | 9 |
|  | $2 \cdot 3$ | Sampling design | 9 |
|  | 2.3.1 | Method of marking two point |  |
|  |  | cluster in the grid | 9-10 |
|  | 2. 4 | Field methodology | 10-13 |
| Chapter is | DATA PROCESSING |  |  |
|  | 3.0 | Processing on electronic computer | 14 |
|  | 3.1 | Area computation | 14 |
|  | 3.2 | Volume estimation | 14-16 |
|  | 3. 3 | Stand and stock tables | 17 |
|  | 3.4 | Sampling error | 18 |
| Chapter 4 | FOREST INVENTORY RESULTS |  |  |
|  | 4.0 | Forest inventory results | $\begin{aligned} & 20 \\ & 20-22 \\ & 22-26 \end{aligned}$ |
|  | 4.1 | Forest area |  |
|  | 4.1 .1 | Distribution of forest area by landuse classes |  |
|  | DISTRIBUTION OF ACCESSIBLE <br> FOREST AREA : |  |  |
|  |  |  |  |
|  | 4.1.2 | by soil depth | 27 |
|  | 4.1.3 | by soil texture | 28 |
|  | 4.1.4 | by soil erosion status | 29 |
|  | 4.1 .5 | by grazing incidence | 30 |
|  | 4.1.6 | by plantation potential | 31 |
|  | 4.1.7 | by fire incidence classes | 32 |
|  | 4.1.8 | by size class | 33 |
|  | 4.1 .9 | by regeneration status | 34 |
|  | 4.1.10 | by type of injury to crop | 35 |
|  | 4.1.11 | by forest types | 36 |
|  | 4.1.12 | by forest types and comopy | 37-1:0 |
|  |  | density classes |  |

Introduction21.3 Climate2
1.5 Fhysical features3
1.6 Forests ..... 4DESIGN AND METHODOLOGY OF THE SURVEY
1 Design and methodology of the
9
2.3 Sampling design ..... 9

- 4 Cluster in the grid ..... $10-10$
Chapter i 1 DHTA. PROCESSING
3.0 Processing on electronic14
3.2 Volume estimation3.3 Stand and stock tables17184.0 Forest inventory results20
4.1 Forest area22-26
by soil depth28
4.1.4 by soil erosion status ..... 9
416 by plantation potent31
by fire incidence classes33
4.1.9 by regeneration status
35
4.1.11 by forest types ..... 36
density classes
Page(iii)

| 4.2 | Stand and stock tables | 41 |
| :---: | :---: | :---: |
| 4.2.1 | Growing stock in forest types and its critical aspects | 42-43 |
| 4.2.2 | Analysis of growing stock in districts | 44-45 |
| 4.3 | Bamboo area and inventory | 46 |
| 4.3.1 | District wise distribution of bamboo bearing area | 46 |
| 4.3.2 | Distribution of bamboo area by quality classes | 46-47 |
| 4.3.3 | Distribution of bamboo area (overlapping) into "Hacked" and "Non-Hacked" categories | 47 |
| 4.3.4 | Mean number of clumps/ha. | 47-48 |
| 4.3.5 | Mean number of clumps by size classes | 48 |
| 4.3.6 | The clump size class wise distribution of total number of culms (in 000) by roundness | 48-49 |
| 4.3.7 | The clump size class wise distribution of total culms (in 000) by age | 49 |
| 4.3.8 | Bamboo stock in -Tonnes | 49 |
| 4. 4 | Sampling error | 50 |
|  | LIST OF TABLES |  |
| 1.5.1 | Human population and live-stock population/density | 6 |
| 1.5.2 | District wise area under forests and agriculture | 7 |
| 1.5.3 | Districtwise rainfall and temperature data of selected places in survey area. | 8 |
| 4. 1 | Districtwise forest area (greenwash as well as demarcated blanks) and number of sample plots inventoried therein | 21 |
| 4.1.1 | Distribution of forest area (tree covered shown by greenwash and of demarcated blanks on toposheets) and number of sample plots inventoried therein by landuse | 23-25 |
| 4.1.12 | Distribution of accessible tree forest area (excluding plantation) by forest types and canopy density classes | 38-39 |


| $\begin{aligned} & \text { IV. } 2.1 \\ & \text { to } \\ & \text { IV. } 2.18 \end{aligned}$ | Distribution of total volume by species and diameter classes and volume/ha. by dia. classes in accessible tree forest area | 51-68 |
| :---: | :---: | :---: |
| $\begin{aligned} & \text { IV. } 2.19 \\ & \text { to } \\ & \text { IV. } 2.36 \end{aligned}$ | Distribution of total stems by species and diameter classes and stems/ha.by dia.classes in accessible tree forest area | 69-86 |
| $\begin{aligned} & \text { IV. } 2.37 \\ & \text { to } \\ & \text { IV. } 2.40 \end{aligned}$ | Distribution of total volume by species and diameter classes in accessible tree forest area (all districts combined) forest type wise | 87-90 |
| $\begin{aligned} & \text { IV. } 2.41 \\ & \text { to } \\ & \text { IV. } 2.44 \end{aligned}$ | Distribution of total stems by species and diameter classes in accessible tree forest area (all districts combined) forest type wise | 91-94 |
| IV. 2.45 | Distribution of total volume by species and diameter classes in accessible tree forest area (all districts and forest types combined) | 95 |
| IV. 2.46 | Distribution of total stems by species and diameter classes in accessible tree forest area (all districts and forest types combined) | 96 |
| $\begin{aligned} & \text { IV. } 2.47 \\ & \text { to } \\ & \text { IV. } 2.50 \end{aligned}$ | Distributidn of vol./ha. by species and diameter classes in accessible tree forest area (all district combined)Forest trpe wise | 97-100 |
| $\begin{aligned} & \text { IV. } 2.51 \\ & \text { to } \\ & \text { IV. } 2.54 \end{aligned}$ | Distribution of stems/ha. by species and diameter classes in accessible tree forest area (all districts combined) Forest type wise | 101-104 |
| IV. 2-55 | Distribution of vol./ha. by species and diameter classes in accessible tree forest area (all districts and all forest types combinedy | 105 |
| IV. 2.56 | Distribution of stems/ha. by species and diameter classes in accessible tree forest area (all districts and all forest types combined) | 106 |

MAPS 1. Location map of Southern \& ..... 5 Eastern Rajasthan
2. Sketch showing sampling design ..... 12 and layout of plots
3. Map showing 'Forest area' in ..... 19 Southern and Eastern Rajasthan
Appendix I Year of survey and publication ..... 107 to 116of sol topo maps used for forestinventory in Southern \& EasternRajsthan

## SUMMARY

The forest inventory survey has been carried out in Southern and Eastern Rajasthan consisting of the distzicts of Alwar. Bharatpur, Jaipur, Sawal Madhopur, Bunde Tonk, Chittorgari, Kota, Ajmer, Bhilwara, Jalour, Barmer, Banswara, Dungarpur, Jhal ewar, Jhunjhunu, Pali, Udaipur (only Bhim Tehsil), sikar and Sirohi during 1984 to 1986.
2. The objectives of the survey were to assess the forest resources and changes therein, so as to focus attention on its critical aspects, thereby helping in development planning.
3. Total geographical area cquered is $182508 \mathrm{~km}^{2}$ of (which 9.39 percent ( $17,13,3.32 \mathrm{~km}^{2}$ ) was forest area in 1969 (reference year) which is far less than that prescribed in the national forest policy.
4. From the present status of the forest area assessed in this survey, the following position amerges:-

|  | Status | Area ( $\mathrm{km}^{2}$ ) | Percentage |
| :---: | :---: | :---: | :---: |
| (a) | Inaccessible area | 179.75 | 0.82 |
| (b) | Area diverted to non forestry uses (1969 to 1985) | 1497.03 | 6.85 |
| (c) | Degraded, Barren, scrub and grassland | 5208.03 | 23.83 |
| (d) | Bamboo brakes | - | - |
| (e) | Accessible tree forest area | $14970.76$ | 68.50 |
|  | Total: | $21855.57 /$ | 100 |

The assessment of the forest inventory is for the accessible tree forest area.
5. The overall average canopy density - over the entire tree forest area is 36.60 percent.
6. The soil depth is adequate over most of the forest area and only 16.95 percent area is assessed to be suffering from moderate and heavy erosion.
7. $\quad 10.159 .77 \mathrm{~km}^{2}$ of the forest area is potentially plantable.
8. Natural regeneration of economically important tree species is aqequate only over a negligibly small area or $43.95 \mathrm{~km}^{2}$ ( $0.29 \%$ ).
9. Bamboo occurs only in overlapping form over an area of $522.44 \mathrm{~km}^{2}$ (Hacked-211.776 $\mathrm{km}^{2}$ \& non Hacked 317. $664 \mathrm{~km}^{2}$ )
10. Four forest types have been identified in the survey area. The assessment of average stock (volume) per hectare and stand ino.ofstems) per hectare, in these
types, is 'as under:-

| Forest type | Total area <br> (ha) | Vol/ha <br> $\left(\mathrm{m}^{3}\right)$ | stems/ha <br> (Nos) |
| :--- | ---: | :---: | ---: |
| Teak | 113411 | 12.937 | 119.490 |
| Khair | 100942 | 3.308 | 69.392 |
| Salai | 97842 | 30.020 | 249.038 |
| Miscellaneous | 1184881 | 8.825 | 91.301 |

Non-
Hacked Bamboo acea (overlapping)
Number $0 \tilde{F}$ equivalem sound cilms:
Drif weight
rit weight :
(in ron Hacked area)
11. The districtwise breakup of the accessible tree forest area alongwith per hectare average stand and stock figures is :-

| S. No.District $\begin{aligned} & \text { Area } \\ & \text { (ha) }\end{aligned}$ | $\begin{aligned} & \text { Vol } \frac{1}{3} / \mathrm{ha} \\ & \mathrm{~m}^{3} / \mathrm{ha} \\ & \hline \end{aligned}$ | sters/ha |
| :---: | :---: | :---: |
| 1. Alwar 105696 | 20.487 | 230.340 |
| 2. Bharatpur 54994 | 1. 251 | 38.033 |
| 3. Bundi 84603 | 7.101 | 77.683 |
| 4. Jaipur 56097 | 6.018 | 99.652 |
| 5. Sawai Madhopur206310 | 6.138 | 96.695 |
| 6. Tonk 14250 | 7.713 | 92.500 |
| 7. Chittorgarh 221316 | 12.732 | 110.039 |
| 8. Kota 264682 | 9.078 | 86.787 |
| 9. Ajmer 29166 | 4.082 | 63.103 |
| 10.3hilwara 45616 | 6.179 | 65.957 |
| 11.Barmer \& Jalaur22537 | 5.326 | 72.771 |
| 12. Banswara 52201 | 12.066 | 84.500 |
| 13. Dung erpur 34566 | 13.099 | 90.512 |
| 14.Jnalamea. 58724 | 3.973 | 31.613 |
| 15. Thunjhunu 12030 | 5.160 | 70.714 |
| 16.Pali a Udaipur 92075 | 16.607 | 135.433 |
| 17. Sikar (Part) 30321 | 6.984 | 95.257 |
| 18.S1rohi_ 111866 | 15.975 | 123.075 |
| Total 1497075 | 10.151 | $10^{2} .270$ |

## (iii)

12. The wial growing stock is assessed at 15.20 million cubic metres corresponding to 153.11 million stems.

## Chepter 1

## THE BACKGROUND


1.1

Introduction
The Forest Survey of India, organisation
had been set up with the aim of monitoring, over a 10 year cycle, the dynamics of change relating to forest resources and to present data focussing attention of the planners on criticel aspects of forest resources in the country. The Expenditure Finance Committee Memo (No.6-33/79-F-II) stressed that the activities of Forest Survey of India would be directed towards supplying data for regional. State and National level planning. The following are the objectives of the Forest Survey of India(FsI) relevant to the inventory Survey undertaken by this zone.
i) To monitor periodically (on a loyear cycle) the changing situation of land and forest resources and to focus attention of national planners on critical aspects of forestri.
ii) To collect the data necessary for development planning.

The field inventory methodology necessary to fulfil the above objectives was formulated with the assistance of the Central Statistical Organisation(CSO). The present data is in readily usable form for the National/State level planning. The design for field inventory has been kept uniform for the entire country.

The Aravalli hill range running south West to North East roughly divides the State of Rajasthan into two parts. The lower half of the area in the south and south east of this hill range gets a better rainfall. The annual average ranges from about 500 mm to 1000 mm whereas the area to the north and north west of this receives low rainfall around 300 mm annually on the average. The latter area largely forms the great Indian desert whereas most of the forested areas are located on these Aravalli hills and in the areas south and south east of these i.e. in the areas adjoining the States of M.P. and Gufrat. This is the region mainly covered under. the present inventory survey.

Out of the total 26 districts of Rajasthan State, 20 districts have been covered during-tho. current survey. These districts are- Alwar, Bharatpur, Jaipur, Sawai Madhopur. Tonk, Chittorgarh, Kota, Bundi Ajmer, Bhilwara, Jalaur, Barmer, Banswara, Dungarpur, Jhalawar, Jhunjnunu, Pali, Udaipur(only Bhim Tehsil). Sikar and Sirohi. Only Bhim tehsil of Udalpur district has been included in this survey, as the rest of the Udaipur district has already been surveyed and inventory reported by PISFR and therefore excluded from the current survey. A new (27th) district of Dholpur had recently been carved out of the existing district of Bharatpur. Since the boundaries, of this newly created district of Dholpur, were not available on map, this district has been treated as a part of Bharatpur district with its old boundaries for our survey work. The remaining six districts of Rajasthan have comparatively very small and scattered areas under forests and have, therefore, been excluded from this survey.

Forest inventory, in this region, was conducted from 1984 to 1986. 1.2 Location and boungaries

The survey area lies between $70^{\circ}$. $0^{\prime \prime}$ to $78^{\circ} 30^{\circ}$ East longituaes and $23^{\circ} 0^{\prime}$ to $280^{\circ} 30^{\circ}$ North lattitudes (see location map enclosed). It is bound on the east by M.P. \& U.P. States, on the south by Gujrat State, on the west by Pakistan and on the north by four districts of Jaisalmer, Jodhpur, Nagaur, Churu as.well as the State of Haryana.

### 1.3 Climate

The climate of the survey area is generally dry with prolonged summers. The year is differentiated by three aistinct seasons, namely hot season (March to June), rainy season (July to September) and cold season (December to February). The annual rainfall varies from 300 mm to $100^{\circ} \mathrm{mm}$ over the region. Tine maximum summer temperatures range between 370 C and $48^{\circ} \mathrm{C}$ and the minimum winter temperatures range between $0^{\circ} \mathrm{C}$ and $10^{\circ} \mathrm{C}$ (table No.1.3.1)

### 1.4 Physical features

The hills of Aravalli system alongwith
its offshoots form the major physical feature of the area. The overall physiography, in the region, varies from flat and gently sloping to undulating
hills, broken ground and also a few fertile valieys and high table land. Some offshoots of the Vindhyan system of hills are also encountered in the districts of Kota and Bundi. There are a number of river -systems like Chambal. Banga , Banes, Sabi, Parbati etc. draining the area but most of these are nonperennial. Chembal river is the main perennial river which drains the: Southern and South Eastern portions of this region. A special physical feature of the area is "Sambhar" lake-located in Jaipur district which is the largest natural salt lake of India.

In this region the altitude varies from 160 M above MSL to $1722^{\mathrm{M}}$ above MSL. The highest elevation is 1722 M and is encountered in the district of Sirohi. The lowest level is 16 CM . located in Bheratpur district.
1.5 Socio economic corditions of the peocle

In this region the population is mainly rural and the main occupations of this rural population are agriculture and livestock rearing. The average density of human population is 134 fer $\mathrm{km}^{2}$ (compared to $100 \mathrm{per} \mathrm{km}^{2}$ for Rajasthan State) whereas the average density of live stock population is 176 per $\mathrm{im}^{2}$. The aistrictwise human as well as livestock population is given in the table No. 1.5 .1 and the districtwise area under forests and agriculture is given in thee tacle No. 1.5.2. Industrially the whole region is cverall backward.

Classification of forests into types has been done on the basis of occurence of specios. The following forost types were found in the surves area:

1. Teak forest - Forests in which Teak trees constitute more than $20 \%$ of the stand.
2. Khair forest - forests in which Khair trees constitute more then $50 \%$ of the stand.
3. Salai forest - forests in whjoch Salai trees constitute more than $50 \%$ of the stand.
4. Miscellaneous - tree forents which could forest not be classified in any of the above types.




Table No. 1.5.2
Distrlctwise area under forests and agriculture

| S1. District | Geographical area ( $\mathrm{km}^{2}$ ) | $\begin{aligned} & \text { Agricultyral } \\ & \text { area (km}) \end{aligned}$ | \% of Geographical area | *Forest area under demarcated $\&$ Undemarcated greenwash \& demarcated blanks ( $\mathrm{km}^{2}$ ) | \% of Geogra phical area |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1. Alwar | 8380 | 5383 | 64.24 | 1367.83 | 16.32 |
| 2. Bharatpur | 8100 | 4073 | 50.28 | 726.34 | 8.97 |
| 3. Bundi | 5550 | 2860 | 51.53 | 1390.51 | 25.05 |
| 4. Jaipur | 14068 | 9524 | 67.70 | 1097.55 | 7.80 |
| 5. Swal Madhopur | 10527 | 5495 | 52.20 | 2661.23 | 25.28 |
| 6. Tonk | 7194 | 5020 | 69.78 | 310.28 | 4.31 |
| 7. Chittorgarh | 10856 | 3980 | 36.66 | 2635.13 | 24.27 |
| 3. Kota | 12436 | 8333 | 67.01 | 3790.62 | 30.48 |
| 9. Ajmer | 8481 | 4700 | 55.42 | 472.69 | 5.57 |
| 10. Bhilwara | 10455 | 4095 | 39.17 | 601.74 | 5.76 |
| 11. Barmer | 28387 | 2099 | 7.39 | 148.85 | 0.52 |
| 12. Banswara | 5037 | 2642 | 52.45 | 1139.72 | 22.63 |
| 13. Dungarpur | 3770 | 1581 | 41.94 | 620.41 | 16.46 |
| 14. Jalor | 10640 | 8108 | 76.20 | 213.70 | 2.01 |
| 15. Jhal awar | 6219 | 3327 | 53.50 | 1108.55 | 1.7 .83 |
| 16. Jhunjhunu | 5928 | 4714 | 79.52 | 401.01 | 6.76 |
| 17. Pali | 12387 | 8175 | 66.00 | 850.70 | 6.87 |
| 18. Sikar | 7732 | 6126 | 79.23 | 615.08 | 7.95 |
| 19. Sirohi | 5136 | 2151 | 41.48 | 1494.61 | 29.10 |
| 20. Udatpur(Part) <br> (Bhini Cohsil) | 1225 | $319^{+}$ | 25.96 | 209.02 | 17.05 |


Contents



[^0]
## Cnzpter - 2

### 2.1 Desion ind Mwinodology of the Susyoy

The 'forest aretas mizked on $1: 50,000$ wc-1 $=$ topographlc map thecta prepared by the Survey ot Irain. were used as the basis of foreat inverats:y. Thu year of wurvey and publication of tho mipa uasd in the survey ara given in Appendix-I. no moitear tite ciamgo In the forzst cuver thematic maps prepared ky interpreretion of litratt aerial photegrapha wers tu E* ujai. Such thesutic maps were to foriu the EEjix for collection of growing stodk dati. Howeveithemetic maps were not available due 100 cosaurainte befond the control of the urganiseriot.

## 2.2


The following are treatud ma 'Yermet areis' tír carrying out the forest inventory and fur the purpoea of this report.

1) All those areas aboivin in greed wist in an the Survey of India tepagrexphso inup ancet..
2) All those areds ingadcaced by cutrad line $v$

2.3

## Samplinci Ezvicn


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 these sanple poines.

Thatungti and width or each gitd fis mus-nifot



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If the selected random nuntexis ard leas vical 629 and 915 respectively then they ofe retainad $\rightarrow$ such otherwise the revt randem nunder is consicution. Suppose the rancon numbers seleated are $1+\frac{1}{\text { entat } 1 \mathrm{bl}}$ respectively, then the numbers wili corfesponi vo 14.4 man and 16.1 mon lengths alorgg cha $X$ cind $X$ whita respectively. To these lengehs viz 14.4 dum end 16. O. 3 गun 1 s adaed. Now 14.7 muland 14.4 wan bécum the co-ordinates of the first samule foint ir. viec efras. Haking SW corner of this gria as ondgin whi nimabujuas

Centre Of the first plot is merlici. rne ceatre us the first ifot is then jolnea bu o itraigsi dirac to
 On this extended line the second poliat $1=$ untised at a distance equal to the disterace of cha firsu. point from grid centre This point is the centic of the second plot.

A11 sample points falling in fictest aries ari located on the ground. Quancitetive ciato it colisocu. frou sample plots and qualitative data Ercin tras surroundings of the plot. The comoritnates ow the plot centres 1nvertoried and the relevaric anite pertalning to these plots 15 giver in fopenaix-mp.

### 2.4 Field methodology

The field data is collected by e crew. consisting of one Junior Iechnical hwistanat (crew luwnai).
 ungkilled labourers hifed locelly wherever necessing. The crew leduer is provided with a list of badgie ficis to be surveyed by his crew during trae deasen wiongo. theh.


 ind ranging rods ztc. are provicta.

AEter deciding the plot and the giad fundu: bu bs surveyed on a particular day ficor a remarang =ijut the cfew leader ruaches a frominent physical featula
 sample point as powsibled which is depfotea on the indy and Can also be 1 duntified on the grounce Uwinaly :


## 1) Bénck mark

11) Iriangulation points
12) Village trijuncticn puints
iv) Bridges and culverts
v) Temples. mosques and chuectues.


Having located a frominent phrsical tadture (reterence polnt) both on the giounc is well as on tire

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=b=arlng.distance of the sample DO1nt fron the rofufunnc


 cost study for the inventory and helping to salcuacs the point at a future date. Specifinn or this worn igiven in Appendix-III. Fron the rerirence poinc erxim leader traverses the distance 1a the direceld. as medsured on the map to Feach the ismaple puinc.



 dixections 1s haid out on the ground oy natianition




 data in the EOllowing ificld forms:

1) Plot dencription form
2) Sanple tree foru

v) Bamboo Enukeration form (Non cinap i.ri......
vi) Bamboo welght Eorm
vi1) Herbs and shrubs duti EOfm
－ーミラー．

## SKETCH SHOWING SAMPLING DESIGN <br> AND <br> LAYOUT OF PLOTS




$\frac{135}{02-03}$
40

Facsimile of the above f゙1eld fornis may be Eound in ApFendix-III. They are briefly acecribed below:

Plot deseripeion Forin(2Dé)
F - Dualltative dati such as lend use. arop composition of erte crop anditu densicy. bacan=luy or erosion in thu ared. fire ghu grazing incianare. regeneration status etc. are recorced tn this fec.u. Tha basis or assessment is occuler. iy einainanaj a surfounding area of abour 2 han around ine piot centre:
(ii) Plot enumeration Form (PEF)

In this form the trees ard banaco =luap. i..
 their specites and diameer at brease helust.
(1i1) Samnlatrec Fotm (STE)
Whe dara in this fona is collented cran era norcher quarter of the sample ploc. Hand of the trea species, 1 tis diaduecer at brevic he ngote tirite berk thichness, domunance btacus. leagts oz tha

 foim helps in developing the locil voluan equatucan. for the ypectey in the survey areag Casi=: kast. volume is also derived from the lcoel vol, win whathen. with the help or barts thickness data.

Fox7n


 In cech clump, their siza, Hicurity centi-ív.i. ..ent. $:$. etc are recorded.
(vi) Bancoo welahe Foin

 data on weight are recordea in thaz zorza.
$=\left(\overline{V_{1}}\right) \overrightarrow{H E r b s}$ ind shnibes dist., E.ona.
In this form names and oracer det=1? wif sll
identifiable species of herbs and shewe.. ara racosam In caso of zpeciey that cula not be fatatititei in tin ícta. the number of such specics unly wre tuccu.

The above 1: a brief dėcripeicn or the deais: and given in survey mechodology. The ditaile ate givie. in the Minual of instruction for rialu lavencery of Coresc Survey of India.

## CHAPTER－ 3

## DETA PROCESSING

## Frocessisc on elestronic computer

After the completion of fisld worl，the fiela forms（i to vii）of the region surveyez cré consolidated and sent to the data processing unit of tinis organisation at Deheadun．The aata contained ir．the fielo Forms are checked for inconsistencies ano coaing mistakes．The coded data is then transferred on to punch card using punching machines．Funching mistakes，are detected with the help of rard verisier， and the mistakes，if any，are rectified．Tne cards are then sorted and loaded onto the computer．A suitable programme is evolved to get the results in the desired format．

## 3.1

## A＝ea computation

The area of＇forest 1 and＇on the 1：50．000 scale，topographical maps was calculated using closely spaced dot grid template where one dot represented one hectare．The district－wise forest area was separately computed in respect of greenwash and demarcated blanks to obtain more reliable information about changes occuring in each category．Further distribution of forest area unjer various classes such as land use，accessible tree forest area，forest type， soil erosion，status，grazing incidence，fire incidence， canopy density classes etc．was arrived at proportio－ nately using ratio estimator．However it may be noted that area tables are basea on few sample points and therefore，should be considered as indicative only and used with due caution．

## 3． 2 Volume Estimation

Collection of felled tree data by zones for developing general volume equations has been disconti－ nued．Therefore，the height diameter date of samole trees of current survey area were compared with height difmeter data of other project areas completed by this organisation in the past for which general volume equations of species were available based on actual felfed trees．The felled tree data．found to match most closely were adopted for the present aras．－


1. Acacia Catechu and Acacia speckles (Surat Circle) $V=-0.009686+0.367188 \mathrm{D}^{2} \mathrm{H}=0.012914\left(\mathrm{D}^{2} \mathrm{H}\right)^{2}$
26 Anogeissus ${ }^{69}$ latifolia(Udaipur report)
$V=-0.016909+0.252906 \mathrm{D}+0.359305 \mathrm{D}^{2} \mathrm{H}$
2. Anoqeissus ord 70 N

$$
\frac{V}{D^{2}}=0.424503-0.009419 D^{2} H-0.012484 / D^{2} H
$$

4. Boswellia serrate (Udaipur report)

$$
\frac{\mathrm{V}}{\mathrm{D}^{2} \mathrm{H}}=0.382544-0.000751 / \mathrm{D}^{2} \mathrm{H}
$$

263
5. Diospyros melanoxyion(Surat Circle)
$V=-0.013104+0.365321 D^{2} \mathrm{H}$
$=\boldsymbol{F}^{\prime \prime}$ canea coromandelica(Udaipur report)

$$
V=-0.004511+0.377131 \mathrm{D}^{2} \mathrm{H}
$$

7. Tectona grandis(udaipur report)
$V=0.008690+0.323051 D^{2} H$

$$
841
$$

G. Wrightia tinctoria(Mahboobnaqar A.P.)
$V=0.009486+0.232207 D^{2} H$
9. Rest of species(Udaipur report)
$V=0.012804+0.327792 D^{2} H$
The name in brackets is the report on which the equations is based.

On the basis of the above general volume equation the following local volume equation were derived for Rajasthan Survey area.

## $\ldots$-...Acacia catechu

$$
V \dot{V}=-0.02471+0.16897 D+1.12083 D^{2}+2.93280 D^{3}
$$

t. Asacia soecies

$$
\sqrt{v}=-0.00142+2.61911 \mathrm{D}-0.54703 \cdot \sqrt{\mathrm{D}}
$$

$\sqrt{3}^{1 .}$ Anogeissus latifolia

$$
V=-0.01662+4.42680 D^{2}
$$

$\sqrt[4]{ }$ Anogeissus penduia
$V / D^{2}=4.77386+0.00085 / D^{2}-0.35165 / D-0.90585 D$
5. Boswellie serzate

$$
\sqrt{V}=-0,11629+2.42540 \mathrm{D}
$$

6. Diosprios melanoxylon

$$
V=0.15581-2.20750 D+9.17559 D^{2}
$$

1. Lannea coromanaelica
$V=-0.00146-0.39953 D+5.33395 D^{2}$
F. Tectone arandis
$V=-0.01066+0.18542 D+1.95540 D^{2}$
F. w-ichtie tinctorie
$V=0.00471+1.79326 \mathrm{D}^{2}$
2. Rest of species
$V=0.07609-0.93105 D+5.19023 D^{2}$
In the equations:-
$V$ Unáerbark volume (m) ${ }^{3}$ upto 5 cms top, overbark limit.
$D=$ Breast heignt overba-k diemeter ( $m$ )
$\mathrm{H}=$ Total standing height ( m )

## 3. 3 Stand and stock tables:

The volume of cach enumerated tree of a species was estimated by substituting its breast helghtoverbark diameter in local volume equation of that species. - The volumes converted to per. hectare were stored in a tree/plot volume file. together with species code, diameter of tree, parameters of plot description form, per hectare volume and stems of the plot. The elements of information stored in the above files were utilised to classify the tree by species and diameter. Estimates of number of stems and volume per hectare and total by species and diameter classes were obtained for different strata viz. district, forest types etc..

## 3.4 <br> Sampling error

The sample was, considered to constitute a sample random sample of unequal clusters as in many cases only one plot was available from a grid. The sampling error was calculated as follows:

Let $n=T o t a l$ No. of clusters (grids) in Dis sample-
$x_{i}=$ The No. of plots in the th- cluster gain)
$\begin{aligned} y_{i}= & \text { The total of per hectare volume in the } i^{\text {th }} \\ & \text { cluster }\end{aligned}$
$\bar{x}=\sum_{i=1}^{\Gamma} \frac{x_{i}}{n}=$ avg. No. Of plots per olustef
$\widehat{k} \quad=\frac{\sum_{i=1}^{n} Y_{i}}{\sum_{i=1}^{\sum_{i}} x_{i}}=\begin{aligned} & \text { Estimate of average volume } \\ & \text { jer hectare over all clusters. }\end{aligned}$
$v(\hat{r})=\frac{1}{n(n-1) \bar{x}^{2}}\left(\sum_{i=1}^{n} Y_{i}^{2}-2 \hat{k} \sum_{i=1}^{n} x_{i} y_{i}+\hat{R}^{2} \sum_{i=1}^{n} x_{i}\right)-$
Estimate of standard error of $R$
SEE. $=\sqrt{V(R)}$
3.E. $\%=\frac{\text { S.E. } \times 100}{\text { Near }}=\frac{\text { EoE. } \because 100}{\hat{R}}$

The S.E. of the total volume for the region as a whole is calculated by pooling the SEs of Vol./ha. of districts, using the formula
$S E(V o l . E \in$ sion $)=\sqrt{S E_{1}^{2} \cdot A_{1}^{2}+S E_{2}^{2} \cdot A_{2}^{2}+\cdots \ldots \ldots S E_{n}^{2} \cdot A_{n}^{2}}$
Where $S E_{1} \ldots \ldots . . n$ are $S E s$ of district 1 to $n$ and $A_{1} \ldots . . . . n$ are areas of districts 1 to $n$

SE(Vol. region) $\%=\frac{\text { SE(Vol. region) } \times 100}{\text { Total Vol. of region }}$

## Chapter 4

## Forest Inventory Results

4.0 This-chapter incorporates the compilation of results of forest inventory in respect of the area surveyed alongwith highlighting of critical aspects of forest resources. Since the survey is of a low intensity (0.01 percent), its results are valid only for the region as a whole. However. districtwise information of some of the attributes has also been given which may be considered as indicative only.

Forest area
Forest area has already been defined in Chapter 2. This is an essential component of forest inventory anc is computed from maps. In the present survey SOI topo sheets on $1: 50,000$ scale formed the basis of inventory survey and as such these were made use of in computing forest area and estination of growing stock by ground surveys.

The survey area is covered by 350 topo sheets of $1: 50,000$ scale viz:- $40 \mathrm{~J} / 4,8,12,15,16$ $40 \mathrm{~K} / 1,5,6,9,10,11,13,14,15,16 \quad 40 \mathrm{~L} / 13 \mathrm{~m} \quad 40 \mathrm{~N} / 3,4,6,7$, $=8,10,11,12,15,16 \quad 40 \quad 0 / 1,2,3,4,5,6,7,3,9,10,11,12,13$.
 $7,8,10,11,12,15,16 \quad 45 \mathrm{~B} / 3,4,7,8,11,12 \quad 45 \mathrm{C} / 1,2,3,4$, $5,6,7,8,9,10,11,12,13,14,15,1645 \mathrm{D} / 1,2,5,6,7,9,10,11$, $13,14,15 \quad 45 \mathrm{~F} / 4,8,12,15,16 \quad 45 \mathrm{G} / 1,2,3,4,5,6,7,8,9,19$, $11,12,13,14,15 \quad 45 \mathrm{H} / 1,2,3,545 \mathrm{I} / 9,10,13,14,15$ $45 \mathrm{~J} / 4,6,7,8,9,10,11,12,13,14,15,16 \quad 45 \quad K / 1,2,3,4,5,6$, $7,3,9,10,11,12,13,14,15,1645 \mathrm{~L}, 1,2,3,4,5,6,7,8,9,10$, $11,12,13,14,15,16 \quad 45 \mathrm{M}, 1,2,3,4,5,6,7,8,9,10,11,12,13$, $14,15,1645 \mathrm{~N} / 1,2,3,4,5,6,7,3,9,10,11,12,13,14,15,16$ $450,1,2,3,4,5,6,7,3.9,10,11,22,13,24,15,15 \quad 45 \mathrm{P} / 1,2$, $5,6,9,20,13,14,15,16 \quad 46 \mathrm{E} / 5,6,9,10,11,13,14,15$ 46 I, 1, 2, 3, 4, 5, 6,7,8,9, 10,21, 12,13,14, $46 \mathrm{M} / 5,9,13$
_5. $0 / 4,3,-12,16 \quad 54,2 / 1,2,3,4,5,5,7,8,9,10,11,12,13,14$, 15,1654 B/ $/ 2,2,3,4,5,0,7,8,9,10,11,12,13,14,15,16$ $54 \mathrm{C} / 1,2,3,4,5,5,7,3,9,10,11,12,13,15,16 \quad 54 \mathrm{D} / 1,2,3$, $4,5,6,7,3,3,10,11,12,13,14,15,16 \quad 54 \mathrm{E} / 1,2,3,4,5,6,7$, $8,11,12,1654 \quad 5 / 1,2,3,4,5,6,7,8,9,10,11,13,14$ $54 \mathrm{G} / 3,4,7,8 \quad 54 \mathrm{H} / 2,3 \quad 54 \mathrm{~J} / 1,2,5$. Each of these sheets, glongwith the respective year of survey, has been listed vice appendix I.
mough the years of survey of these sineets vary from 1930-31-to 1978-79 but the majority of these is-clustered around the year 1969 which is taken to be the base year for monitoring the changes in the forest areas till 1985 (1784 to 1986 being our field surpey years).

The forest areas corresponding to the base year, have been computed from the green-wash as well as demarcated blanksín on survey of India topo sheess with the help of dot grids. These areas, districtwise.... alongwith the ntmber of sample plots inventoied therein are given below in table 4.1.

Table No. 4.1
Districtwise forest area(greenwash as well as demarcated blanks) and number of sample plo.ts inventoried therein.

| Sl. District | Forest area $\mathrm{km}^{2}$ |  |  | No. of sample ploEs | Weightage <br> of area <br> ( $\mathrm{km}^{2}$ ) <br> per slot |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Green wash | Demarcated blank and Acriub | Toさal |  |  |
| $1 \quad 2$ | 3 | 4 | 5 | 6 |  |
| 1. Alwar | 1075.91 | 291.92 | 1367.83 | 154 | 8.88 |
| 2. Bharatpur | E51.87 | 74.47 | 726.34 | 70 | 10.38 |
| 3. Bundi | 992.47 | 398.04 | 1390.51 | 156 | 8.39 |
| 4. Jaipur | 458.87 | 638.68 | 1097.55 | 135 | 8.13 |
| 5. Sawai Madhopur | 1932.42 | 728. 81 | 2661.23 | 30.7 | 8.67 |
| 6. Tonk | 143.82 | 166.46 | 310.28 | 37 | 8.39 |
| 7. Chittorgarh | 2553.17 | 81.96 | 2635.13 | 306 | 8.61 |
| 8. Kota | 3501.09 | 289.53 | 3790.62 | 401 | 9.45 |
| 9. Ajmer | 起58.18 | 214.51 | 472.69 | 47 | 10.06 |
| 10.3nilwara | $4 \in 7.47$ | 134.27 | 60:. 74 | 62 | 9.71 |
| 1i. Sammer | 70.02 | 78.83 | 148.85 | 14 | 10.63 |
| 12. Banswara | 1063.14 | 76.58 | 1139.72 | 131 | 8.70 |
| 13. Dungarpur | 540.00 | 80.41 | 620.41 | 70 | 8.86 |
| 1s.Jalcr | 182.77 | 30.93 | 213.70 | 23 | 9.29 |
| 15. Thal awer | 705.86 | 402.69 | 1109.55 | $: 17$ | 9.47 |
| $\pm 6$. Jhunj hunu | 47.09 | 383.92 | 401.01 | 50 | 9.02 |
| 17.Pali | 773.01 | 77.69 | 850.70 | 102 | 8. 34 |
| 18. Sikar | 125.68 | 489.40 | 615.08 | 71 | 8.66 |
| 19. Strohi | 1382.03 | 112.58 | 1494.61 | 163 | 9.17 |
| 20. Udaipur (part) | t) 208.45 | 0.57 | 209.02 | 20 | 10.45 |
| Bhim Tehsil |  |  |  |  |  |
| Total 1 | 17133.32 | 4722.25 | 21855.57 | 2445 - |  |

Only 3.39 por cont (17,133.32 $\mathrm{km}^{2}$ ) of the Total reported area of $1,82,508 \mathrm{~km}^{2}$ in the region was under tree forest in the yoar 1969 las per the green wash area of the relevant SOI topo sheets) and 2.59 percent ( $4.722 .25 \mathrm{~km}^{2}$ ) under demarcated blankand sciub.
4.1.1 Distribution 6 forest area by landusc classes

Total forest area (greenwash as well demarcated blank) taken up for survey in the twenty districts of Rajasthan was $21,955.57 \mathrm{k} \mathrm{m}^{2}$. Out of this, an area of 14.970.76_km ${ }^{2}$ ( $68.50 \%$ of the totial) has buen assessed to be under accessible tree forest, an area of $179.75 \mathrm{~km}^{2}(0.82 \%)$ is 1 naccessible, an area of $1497.03 \mathrm{kn}^{2}(6.85 \%)$ is assessed to have been diverted to non-forestry ioes and an area of $520 \% .03 \mathrm{fm}^{2}(23.83 \%)$ ts now under serub/barien land.
'lhe districtwise distribution is given in the following table No.4.1.1.
Table No.4.1.1

CHITTORGARH
No. Area
of $\quad\left(\mathrm{rm}^{2}\right)$
SPs

| Table No.4.1.1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Distribution of Forest area (rree covered shown by greenwash and of demarcated blank on toposheets) and number of sample plots inventoried therein by land use |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | ALWAR |  | BHARATPUR |  | BUNDI |  | JAIPUR |  | SAMNI <br> HADHOPUR |  | TOLK |  | CHITTORGARH |  |
| No. | Land use |  | $\begin{gathered} \text { Area } \\ \left(\mathrm{km}^{2}\right) \end{gathered}$ | NO. of SPs | Area $\left(\mathrm{km}^{2}\right)$ | Wo. of SPs | Area $\left(\mathrm{km}^{2}\right)$ | $\begin{aligned} & \text { Io. } \\ & \text { of } \\ & \text { SPs } \end{aligned}$ | $\begin{aligned} & \text { Area } \\ & \left(\mathrm{km}^{2}\right) \end{aligned}$ | $\begin{aligned} & 10 . \\ & \text { of } \\ & S P S_{s} \end{aligned}$ | $\begin{aligned} & \text { Area } \\ & \left(\mathrm{km}^{2}\right) \end{aligned}$ | No. of SPs | $\begin{aligned} & \overline{\text { Area }} \\ & \left(\xi_{n}{ }^{2}\right) \end{aligned}$ | No. of SPs | $\begin{aligned} & \text { Area } \\ & \left(\mathrm{km}^{2}\right) \end{aligned}$ |
| 01 | Tree forest | 118 | 1048.08 | 53 | 549.94 | 98 | 820.90 | 68 | 552.84 | 238 | 2063.10 | 16 | 134.17 | 253 | 2178.72 |
| 2 | Plantation | 1 | 8.88 | - | - | 3 | 25.13 | 1 | 8.13 | - | - | 1 | 8.39 | 4 | 4 |
| 03 | Scrub forest | 29 | 257.58 | 8 | 83.01 | 57 | 477.46 | 51 | 414.63 | 53 | 459.43 | 13 | 109.02 | 23 | 108.07 |
| 04 | Govt. grass land | - | - | - | - | 1 | 8.38 | 5 | 40.65 | 4 | 34.68 | - | - | -. | - |
| 5 | Barren land | $\cdots$ | - | 1 | 10.38 | - | $\cdots$ | 6 | 48.78 | 5 | 43.34 | 5 | 41.93 | 3 | 25.83 |
| 06 | Agricultural land with/without trees in surround | 4 | 35.53 | 4 | 41.51 | 7 | 58.64 | 2 | 16.26 | 6 | 52.01 | 2 | 16.77 | 22 | 189.46 |
| 07 | Water bodies | - | - |  |  |  | - | - | - | 1 | 8.67 | - | -. | 1 | 51 |
| 08 | Habitation | - | - |  |  |  | - | 1 | 8.13 | - | $\cdots$ |  |  | - |  |
| 09 | Inaccessible | 2 | 17.76 | 4 | 41.50 | - | - | 1 | 8.13 | - | - | - | - | - |  |
|  | Total | 154 | 1367.83 | 70 | 726.34 | 166 | 1390.51 | 135 | 1097.55 | 307 | 2661.23 | 37 | 310.28 | 305 | 2635.13 |
|  | Accessible forest area (01 to 05) |  | 1314.54 | 62 | 643.33 | 159 | 1331.87 | 131 | 1065.03 | 300 | 2600.55 | 35 | 293.51 | 283 | 2437.06 |
| (b) | Accessible tree <br> forest area (01 to 02) |  | 1056.96 | 53 | 549.94 | 101 | 846.03 | 69 | 560.97 | 238 | 2063.10 | 17 | 142.56 | 257 | 2213.16 198.07 |
| (c) | Forest aréa deforested or diverted for other uses ( $06^{\prime}$ to 08) | 4 | 35.53 | 4 | 41. 51 | 7 | 58.64 | 3 | 24.39 | 7 | 60.68 | 2 | 16.77 | $23$ | 198.07 |
|  | Forest area de- | 29 | 257.58 | 9 | 93.39 | 58 | 485.84 | 62 | 504.06 | 62 | 537.45 | 18 | 150.95 | 26 | 223.9 |


Table No. 4.1.1
Distribution of Forest area (Iree covered shown by greenwash and of demarcated blank
on toposheets) and number of sample plots inventoried thereln by ind use


The following conciusions can be drawn from the results tabulated above in table No.4.1.1:-
(a) Out of the total forest area of $21.855 .57 \mathrm{~km}^{2}$ an area of $179.75 \mathrm{~km}^{2}(0.32 \%)$ is inaccessible and an area of $14970.76 \mathrm{~km}^{2}(68.50 \%)$ is under accessible tree forest.
(b) As per the status depicted in the S.O.I. toposheets the tree forest area (green wash) was 17133. $32 \mathrm{~km}^{2}$ (1969). The present (1985) tree forest area is assessed at $15150.51 \mathrm{~km}^{2}$ (Taking that the tree forest area includes accessible tree forest as well as inaccessible forest area). Thus there is a total reduction of $1982.81 \mathrm{~km}^{2}(9.07 \%)$ over the last 16 years in the tree forest area.
(c) Over the last 16 years (1969 to 1995) the demarcated blank and scrub forest has increeased from $4722.5 \mathrm{~km}^{2}$ to $5208.03 \mathrm{~km}^{2}$ i.e. an increase of $485.78 \mathrm{~km}^{2}(2.22 \%)$.
(d) The area which got aiverted to non-forestry uses, over the seme time span (1969'ta 85)is assessed to be $1497.23 \mathrm{~km}^{2}$ ( 6.85 海)
(e) Out of the total accessible tree forest area $0 f 14.970 .76 \mathrm{kn}^{2}$, an area of $320.7 \dot{\mathrm{~km}^{2}}$ is assessed to be uncer forestry plantations.

Note: ithe accessible forest area includes those ereas which could not be visited but were ianentified on the besis of vicinity visit. In such aases as meny attributes as possible were recordes, on the basis of vicinity visit, and rest of attributes which could not be assessed were clubbed under the cetegory "Unrecorded".

### 4.1.2 $\quad \frac{\text { Distribution of accessible forest area }}{\text { by soil aentr }}$

Gut of the total accessible forest area ○£ $20.172 .79 \mathrm{~km}^{2}$, only $14.68 \%$ (2962.71 $\mathrm{km}^{2}$ ) area has soil depth of 90 ms or mofe. More than $60 \%$ of this total area. i.e. 12. $139.14 \mathrm{~km}^{2}$ is having a soil depth of less than 30 cms. The district wise distribution of accessible forest area by soil depth classes is given in the following table NO.4.1.2

Table No. 4.1 .2
Accessible fores
area :20172.79

| ミ1. <br> Nc. District | SOTL DEDTH ELRSS |  |  |  |  |  | $: \mathrm{km}^{2}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |
|  | Soil | Soll <br> aeptl: | Scil deptr. 1 E | Soil aepth | Soil denth | $\begin{aligned} & \text { " Tn+e } \\ & \text { coIded } \end{aligned}$ | Totel |
|  |  | less | cms. $0=$ | 30 cms | 90 cms |  |  |
|  |  | than | moxe but | or more | Or |  |  |
|  |  | 15 cms. | less | but less | more |  |  |
|  |  |  | than | than |  |  |  |
|  |  |  | 30 cms . | 90 cms . |  |  |  |


| 1. | Alwar | - | 26.64 | 346.40 | 692.80 | 248.70 | - | 1314.54 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2. | Bheratpur | - | 114.14 | 321.66 | 134.89 | 62.26 | 10. 38 | 643.33 |
| 3. | Bundi | - | 326.68 | 577.98 | 217.79 | 201.04 | 8. 38 | 1331.97 |
| 4. | Jeipur | - | 154.47 | 235.77 | 39E. 37 | 276.42 | - | 1065.03 |
| 5. | Sawad Nadhopur | 17. 34 | 953.53 | 754.16 | 494.10 | 364.08 | 17.34 | 2600.55 |
| 6. | Tonk | 8. 39 | 58.70 | 109.02 | 41.93 | 75.47 | - | 293.51 |
| 7. | Chittorgo二h | $=$ | 775.04 | 1024.77 | 516.69 | 120.56 | - | 2437.06 |
| E. | Kota | 18.91 | 302.49 | 1399.03 | 860.22 | 841.31 | 9.45 | 3431.41 |
| 9 | dimer | 10.05 | 110.63 | 140.80 | 130.74 | 80.46 | - | 472.69 |
| 10. | Bhilwara | - | 67.94 | 300.86 | 164.99 | 58. 24 | - | 592.03 |
| $\pm 1$ | Baxmer 6 Jal eur | - | 117.58 | 78. 39 | 9.80 | 78. 39 | 39.19 | 323.35 |
| 12. | Banswara | - | 165.30 | 252. 30 | 269.71 | 156.60 | - | 843.91 |
| 13. | Dungarpur | - | 53.18 | 345.66 | 53.18 | 17.72 | $=$ | 469.74 |
| 18. | Jhelawar | - | 94.75 | 506.39 | 303.19 | - | - | 1004.33 |
| 15. | Jhunjihunu" | - | 104.26 | $\pm 20.30$ | 88.23 | 80.20 | - | 392.99 |
| 16. | $\begin{aligned} & \text { Pali \& } \\ & \text { U̇aipur (pay } \end{aligned}$ | $t)^{-}$ | 234.53 | 503.80 | 199.78 | 52.12 | 26.06 | 1016.29 |
| 17. | Sikar | - | 77.97 | 303.21 | 77.97 | 129.94 | - | 589.09 |
| 18. | Sirohi | 9.17 | 394.28 | 522.66 | 302.59 | 119.20 | 9.17 | 1357.07 |
|  | Totel | 63.87 | 4132.11 | 7943.16 | 4956.97 | 2962.71 | 119.97 | 20178.79 |
|  | \% | 0.32 | 20.48 | 39.36 | 24.57 | 14.63 | 0.59 | 100 |

*Unrecorded relates to those points where information could Contents coll ected.
not be coll

## 4．1．3 Distribution of accessible forest area <br> by soil texture

A nigh percentage of $50.41 \%\left(10,172.08 \mathrm{~km}^{2}\right)$ of the total accessible forest area has sandy loam soil followed by $32.66 \%\left(5,589.62 \mathrm{~km}^{2}\right)$ having clayey loan and only $2.57 \%$（ $519.05 \mathrm{~km}^{2}$ ）with clayey soil． The districtwise distribution of accessible forest area by soil texture is given in the following table No．4．1．3．

Table No．4．1．3
Accesstble forest area：20178．79
Unit： $\mathrm{km}^{2}$

|  | SOIL TEKTYRE |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Sl．District | Clayey | Clayey 10 am | Lo am | $\begin{aligned} & \text { Sandy } \\ & \text { loan } \end{aligned}$ | Sandy | $\begin{aligned} & \text { No } \\ & y \quad \text { soil } \end{aligned}$ | Unre cor－ ded | rotal |
| 1．Alwar | － | 71.05 | 115.47 | 1074．72 | 53.29 | － |  | 1314.54 |
| 2．Bharatpur | － | 352.79 | 31.13 | 249.03 | － | － | 10.38 | 6¢3．33 |
| 3．Bundi | 117.27 | 469.09 | 33.50 | 603.11 | 100.52 | － | 8.38 | 1331． 37 |
| 4．Jaipur | － | 73.17 | 97.56 | 788.61 | 105.69 | － | － 1 | 1065.03 |
| 5．Sawai Madhopur | 43．34 | 901.53 | 95． 35 | 1343.52 | 173.37 | 17.34 | 26.00 | 2600.55 |
| 6．Tonk | － | 100.63 | 8.39 | 125.78 | 50.32 | 8.39 | － | 293.51 |
| 7．Chittorgarh | 43.06 | 852.54 | 955.38 | 576.97 | 8.61 | － | － 2 | 2437.06 |
| 8．Kota | 245.78 | 1332.86 | 189.06 | 1635． 35 | 1 | 18.91 | 9.45 | 3431.41 |
| 9．Ajmer | － | 90.52 | 20.11 | 352.00 | 1 | 10.06 | － | 472．69 |
| 10．Bhilwara | － | 397.92 | 38.92 | 15E． 29 | － | － | － | 592.03 |
| 11．Barmer o Jalaur | － | － | － | 235.16 | 48.99 | － | 39.20 | 323.35 |
| ここ．3erswara | 59.65 | 408.91 | 17.40 | 342.00 | － | － | － | 943． 3 3 |
| 13．Dungarpur | － | 327.93 | － | 132.95 | 3.36 | － | － | $469.7 \div$ |
| 14．Jhal awar | － | 540.05 | 94.75 | 369.52 | － | － | － | 1004． 3 |
| iड．Jhunjhunc | － | 24.06 | － | 295.75 | 72.13 | － | － | 392.99 |
| 16．Falt ¢ UJaipu＝ | － | 199.73 | 192.79 | 581.39 | 17.37 | － | 17.37 | 1015．29 |
| 17．Sさkar（Pきェヶ） | － | 43.32 | － | 450.48 | 35.29 | － | － | 539.05 |
| 1e．Eirohi | － | 403.45 | 73.36 | 352.75 | 7.17 | 9.17 | 9.17 | 1357.07 |
| Total | 519.05 | 5509.62 | 1970.56 | 10：72．08 | 743.665 | 53.37 | 119.55 | 20176．75 |
| －\％ | 2.57 | 32.60 | 9.77 | 50.41 | 3.68 | 0.32 | 0.59 | 100 |

### 4.1.4 Distribution of accessible forest erea by soil erosion stetus

82. $41 \%$ of the accessible forest area has almost no soil erosior or slight erosion (where only surface erosion 15 present). $14.09 \%$ aree is having moderate erosion i.e. having small gullies and rills on the top surfece of the soil and only $2.86 \%$ erea is suffering heavy erosior i. $\epsilon$. heving deep gullies. ravines, land sipps etc. The erosion status of the rest of 0. $6.4 \%$ area remains unrecorded $\ddagger$. e. the required infommation could not be collected. The extent of accessible forest area under heavy suil erosion status is relatively lazge in the districts of Sawai riadhopur (182.04 kre2) . Pali \& Ehim Tehsil of Udaipur ( $86.86 \mathrm{jm}^{2}$ ) and Jaipur ( $73.17 \mathrm{~km}^{2}$ ) Distribution of accessible forest ares. dint=ictwise, by the soil erosion statur is given in the following さable No.4.1.4

Table No. 4.1.4
Accessible forest aree : 2017E. 70

| $\begin{aligned} & \text { Sl. Distyict } \\ & \text { No. Dict } \end{aligned}$ | Mild erosion i.e no erosion or slight erosion where only surface erosion has taken place | Mocierate erosior i.e. where small gullies and rills are formed on the top surface of soil | Heavy erosion ie. area which has deep gullies, ravines, land slips etc. | $\begin{aligned} & \text { Unrem } \\ & \text { corded } \end{aligned}$ | ToEal |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1. Alwar | 1287.90 | 17.76 | 8.88 | - | 1314.54 |
| 2. Sharatpur | 612. 20 | - | 20.75 | 10.39 | 643.33 |
| 3. Eundi | 963.30 | 351.82 | 16.75 | - | 1331.87 |
| 4. J̇zipur | 754. 22 | 227.64 | 73.17 | - | 1065.03 |
| 5. Sewaivadiopu- | 1941.74 | 442.09 | 182.04 | 34.08 | 2600.55 |
| 6. Fonk | 175.11 | 117.40 | - | - | 293.51 |
| 7. Cinttorgarh | 2230.39 | 172.23 | 34.44 | - | $2<37.06$ |
| 8. Koむa | 2987.12 | 406.48 | 28. 36 | 9.45 | 3431.41 |
| 9. Ajmer | 412.34 | 50.29 | 10.06 | - | 472.69 |
| 10. Bhilwera | 582. 32 | 9.71 | - | - | 592.03 |
| 11. Barmer \& Jalor | - 176.37 | 78.39 | 29.39 | 39.20 | 323.35 |
| 12.Benswa=e | 756. 91 | 69.60 | 17.40 | - | 843.91 |
| 13. Dungarpur | 336.30 | 124.08 | e. 86 | - | 469.74 |
| 14.Jhalawar | 1004.33 | - | - | - | 1004.33 |
| 15. Jhunjhunu | 320.81 | 56. 14 | 15.04 | - | 392.99 |
| 1E.Paij 6: Udaipux | $=599.35$ | 312.71 | 26.86 | 17.37 | 1016.29 |
| 17. Sikar (PEr) | 459.14 | 103.96 | 25.99 | - | 589.09 |
| 13. Siroha | 1017.80 | 302.59 | 1e. 34 | 18.34 | 1357.07 |
| Total | 16629.15 | 2842.89 | 577.33 | 129.42 | 20178.79 |
| \% | 82.41 | 14.09 | 2.86 | 0.6 | 1nn |

### 4.1.5 Distribution of accessible forest area br grazing incidence classes

$55.55 \%$ i.e. more than half of the total accessible forest area is suffering from heavy grazing followed by $28.43 \%$ area having incidence of moderate grazing. Amongst the surveyed districts, Kota has the largest accessible forest area suffering from heavy grazing (1947.30 $\mathrm{km}^{2}$ ). Distribution of the accessible forest area districtwise by grazing incidence clesses is given in the following table No. 4.1 .5.

Teble No.4.1.5
Accessible forest area : 20178. 79 Unit $: \mathrm{km}^{2}$

| $\begin{aligned} & \text { Sl. } \\ & \text { No. } \end{aligned}$ | District | GRAZING ISCIDENCE |  |  |  |  | Total |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Heavy crazing | Medium arazing | Light arazing | No arazing | Unrecorded |  |
| 1. | Alwar | 897.09 | 230.93 | 151.00 | 8.88 | 26.64 | 1314.54 |
|  | Bharatpur | 228.27 | $31: 29$ | 62.26 | 10.38 | 31.13 | 643.33 |
| 3. | Bundi | 1013.56 | 276.43 | 33.50 | - | 8.38 | 1331.87 |
|  | Jaipur | 422.76 | 447.15 | 154.47 | 24. 39 | 16.26 | 1065.03 |
|  | sawal Madhopur | 1265.60 | 788.83 | 312.07 | 138.70 | 95.35 | 2600.55 |
| 6. | Tonk | 268. 35 | 25.16 | - | - | - | 293.51 |
|  | Chiṫorgarh | 1188. 39 | 955.88 | 215.29 | 60.28 | 17.22 | 2437.06 |
|  | Kota | 1947. 30 | 898.03 | 406.48 | 113.43 | 66.17 | 3431.41 |
|  | Ajmer | 130.74 | 140.80 | 191.09 | 10.06 | - | 472.69 |
| 10. | 3hilwara | 378.51 | 174.70 | 38.82 | - | - | 592.03 |
|  | $\begin{aligned} & \text { Bamer } S \\ & \text { Jalor } \end{aligned}$ | 78. 39 | 97.98 | 78.39 | 9.80 | 58.79 | 323.35 |
| 12. | Inanswara | 469.31 | 269.70 | 43.50 | 8. 70 | 52.20 | 843.71 |
| 13. | Dungarpur | 274.75 | 124.08 | 70.91 | - | - | 469.74 |
| 14. | Jhalawar | 914.33 | 94.75 | 56.35 | 37.90 | - | 1004.33 |
| 15. | Jhunjhunu | 248.53 | 112.28 | 24.06 | 8.02 | - | 392.99 |
|  | Pali $\dot{8}$ Udaipur (Fa | $r=)^{486.43}$ | 364.82 | 138.36 | 8.69 | 17.37 | 1016.29 |
| 17. | Sikar | 389.34 | 103.96 | 95.29 | - | - | 589.09 |
| 18. | Sirohi | 706,04 | 320.93 | 236.40 | 73.36 | 18.34 | 1357.07 |
| motal |  | 11209.29 | 5737.70 | 2.311 .36 | 512.59 | 407.85 | 20178.70 |
|  | \% | 55.55 | 28.43 | 11.46 | 2.54 | 2.02 | 100 |

## 4．1．6 Pjstribution of accessjbie forest grea by plentation potertial

30．10\％ $0 \equiv$ the accessible Iorest aree has been assessed as needing no further stocking by wey of玉iantatior．In $50.35 \%$ of the accessible forest area， there is scope for afforestation or augmentation of stocining by plantations． $12.62 \%$ of the accessiole fofest aree hes beer assessed as unplentable due to absence oE scil cover or othez adverse conditions．Distribution． of accessible forest area dis亡゙ictwise by plantation potential is given in the following table ivo．4．1．6．

Table No．4．1．6
Accessible forest area ：2017E． 79

| $\begin{aligned} & 51 . \\ & 100 . \end{aligned}$ | Disさごくさ | FLaNTATIONEOTENTIAL |  |  |  | Toral |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Un－ | Not | Un－ |  |
|  |  | 2．artable | plantable | 2nrlicatle | recorded |  |
| 2． | F．Iwar | 559.57 | 35.53 | 719.44 | － | 1314.54 |
|  | Bhasatpu＝ | 394． 30 | 72.63 | 166.02 | 10．38 | 643.33 |
| 3. | Bundi | 686.88 | 284.80 | 359．81 | 8． 38 | 1331.87 |
|  | Jaipur | 707．31 | 195.12 | 138.21 | 24．39 | 1065.03 |
|  | Sawal Medhopur | 1152.91 | 433.42 | 979.54 | 34.68 | 2600.55 |
| 6. | Tonk | 192.88 | 33.54 | 41.93 | 25.16 | 293.51 |
|  | Chittorgarh | 835.32 | 292.79 | 1300.34 | 8． 61 | 2437.06 |
|  | Kota | 1852.77 | 217.42 | 1351.77 | 9.45 | 3431.41 |
|  | Ajmer | 221.26 | 90.52 | 160.91 | － | 472.69 |
| 10. | Bhilwara | 417．33 | 48.53 | 126.17 | － | 592.03 |
| 11. | Eanmer a Jalor | 156.77 | 88.19 | 19.60 | 53.79 | 323．35 |
| 12. | Banswara | 417.61 | 165.30 | 261．00 | － | 843.91 |
| 13. | Dungarpur | 239．30 | 53.18 | 177.26 | － | 469.74 |
| 14. | Thal awar | 776．93 | 113.70 | 113.70 | － | 1004．33 |
| 15. | Jhundhunu | 264．67 | 112.28 | 16.04 | － | 392．99 |
| 16. | Paii \＆Udatpur | 199.78 | 138.98 | 677.53 | － | 1016.29 |
| 17. | Sikar（Fコニッ） | 433.15 | 77.97 | 77.97 | － | 589.09 |
| 18. | Sirohi | 651.03 | 91.69 | 605.18 | 9.17 | 1357.07 |
|  | Total | 10159．77 | 2545．59 | 7284．42 | 189.01 | 20178．79 |
|  | $\%$ | 50.35 | 12.62 | 35.10 | 0.93 | 100 |

＊Unrecorded relates to those points where information cuuld not be cellected．
Exolcratory note：
Flantazar potential was assesseã only at those sample points having ＝ree crown cover density of less than $30 \%$ plantable／unplantaile potent－ ial was detemined iy giving due consideration to aspect，soly depth． drainage，crop in surrounding area and other biotic and climate factors． The maximum permissible slope upto which plantation can be raised was kept 400 and minimum soil depth as 20 ans．Sample plots having crown density of $30 \%$ or more wert catagorised as not applicable since plantation potential of such area，from afforestation point of view，is not cs any significance．

### 4.1.7 Distribution of accessible forest aree bu fire incidence classes

Incidence of very heavy fire has been observed only in $0.35 \%$ of the total accessible forest area followed by $0,49 \%$ area having freguent fires. The rest of the area is either having occasional fires or no fire or remained unrecorded in respect of this attributes Distrioution of accessible forest area districtwise by fire incidence classes is given in the following table No.4.1.7.

Table No.4.1.7
Accessible forest area : 20178.79
Unit $: \mathrm{km}^{2}$

| $\begin{aligned} & \text { Sl. } \\ & \text { No. } \end{aligned}$ | District | Very <br> heavy | $\begin{aligned} & \text { FIRE } \\ & \text { Fre- } \\ & \text { quent } \end{aligned}$ | INCIDENCE Occasional | $\begin{aligned} & \text { No } \\ & \text { FIre } \end{aligned}$ | *Un recorded | Totel |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1. | Alwar | - | 17.76 | 692.80 | 559.57 | 44.41 | 1314.54 |
|  | Enaratour | - | - | 10.38 | 601.82 | 31.13 | 643.33 |
| 3. | Burci | 8. 38 | - | 50.26 | 1181.09 | 92.14 | 1331.87 |
|  | Jaipur | - | - | 32.52 | 934.95 | 97.56 | 1065.03 |
|  | sawai Madhopur | 17. 34 | - | 424.76 | 2028.42 | 130.03 | 2600.55 |
| 6. | Tonk | - | - | - | 276.74 | 16.77 | 293.51 |
|  | Chittorgarh | 8. 61 | 34.44 | 1136.73 | 1222.84 | 34.44 | 2437.06 |
|  | Kota | 9.45 | - | 642.80 | 2609.01 | 170.15 | 3431.41 |
| 9. | Ajmer | - | 20.11 | 60.35 | 392.23 | - | 472.69 |
| 10. | Bhilwara | - | - | - | 592.03 | - | 592.03 |
|  | $\begin{aligned} & \text { Barmer } 5 \\ & \text { Jalor } \end{aligned}$ | - | - | - | 244.96 | 78. 39 | 323.35 |
| 12. | Benswara | - | - | 287.10 | 435.01 | 121.30 | 343.91 |
| 13. | Dungarpur | - | 8.36 | 354.52 | 106. 36 | - | 469.74 |
| 14. | Shal awer | 18.05 | - | 274.77 | 682.19 | 23.42 | 1004.33 |
|  | Jhunghunu | - | - | - | 376.95 | 16.04 | 392.99 |
|  | Pali 5 UAaipur (Pミr |  | 3.69 | 191.10 | 799.13 | 17.37 | 1016. 29 |
| 17. | Sikar | 8.66 | - | 43. 32 | 537.11 | - | 589.09 |
| 18. | Sirohd | - | 9.17 | 146.71 | 1182.85 | 18.34 | 1357.07 |
|  | Total | 71. 39 | 99.03 | 4348.12 | 14763.26 | 896.99 | 20178.79 |
|  | \% | 0.35 | 0.49 | 21.56 | 73.16 | 4.44 | 100 |

## 4．1．8 Distribution of accessible tree forest aIer by sizf class

The total accessible tree forest area
is $14970.76 \mathrm{kr}^{2}$ ． $17.97 \%$ of this is under re generation and $58.63 \%$ is unae pole crop． $17.62 \%$ of eccessibie Eree Eosest area 15 under small timber and only $1.67 \%$ area is uncer big timber while
 of the accessible tree Forest arec districtwise by size class is given in the folloking Eable No．4．i．e．

Table No． $4-1 . E$
Accessible tree Eorest area：14970．76 Unit：km？

| E1． <br> No． | DisErict |  |  |  |  |  |  | Total |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Fegene－ ration | Fole crop | $\begin{aligned} & \text { Sinaly } \\ & \text { Timbcr } \end{aligned}$ | $\overline{B i g}$ ثimier： | $\begin{aligned} & \text { Mixed } \\ & \text { size } \\ & \text { cless } \end{aligned}$ | $\begin{aligned} & \text { 天 Urirec } \\ & \text { oraed } \end{aligned}$ |  |
| i。 | diwar | 97.70 | 737.21 | 168．76 | 35．53 | 17.76 | － | 1056.96 |
| 2. | Bhazatpur | 124．51 | 425.43 | － | － | － | － | 549．94 |
| 3. | Bundi | 184．2E | 427．20 | 125.65 | 33．50 | 67.02 | E． 38 | 846.23 |
| 4 | Jaipur | 89.43 | 357.72 | 113.62 | － | － | － | 560.97 |
| 5. | Sawai Madhopur | 563.45 | 1265．60 | 112．69 | 17.34 | 104.02 | － | 2063.10 |
| 6. | Tonk | 8.39 | 125．79 | E． 38 | － | － | － | $142.56^{\prime}$ |
| 7 | Chitさorga＝h | 370．29 | 1386.46 | 387． 52 | 25．83 | 43.06 | － | 2213.16 |
| 8. | Kota | 378.12 | 1635．36 | 463.19 | 47.26 | 122.89 | － | 2646．82 |
| 9. | Aimer | 100.57 | 130.74 | 60.35 | － | － | － | 291． 66 |
| 10 | Bhilwara | 38.82 | 329.99 | 77.64 | 9.71 | － | － | 456.16 |
| 11 | Barme＝\＆Jeフor | 55.79 | 140.98 | 19.60 | － | $=$ | － | 225．37 |
| 12. | E 2 の5wara | 130.50 | 101．41 | 139.20 | 26.10 | 34.80 | － | 522.01 |
| 13 | Dungerpur | 97.49 | 168.40 | 52.04 | － | 17.73 | － | 345．66 |
| $\underline{I} \leq$ | Thal awar | 227.40 | 189.50 | 105．22 | 9.67 | 56． 85 | － | 537．44 |
| $\pm 5$ | Thunjtianu | 24.06 | 56.14 | 2¢．05 | － | 16.04 | － | 120．30 |
| 56． | Eali E Eiappur | 60.81 | $36 \div 82$ | 677.74 | 17．37 | － | － | 920.74 |
| 37 | Sikar（Part） | 25．99 | 251．24 | E． 56 | － | 17.33 | － | 303.22 |
| 18. | Sironi | 110.03 | 58E．8¢ | $23 \leq .25$ | 27．51 | 109.86 | 9.17 | 1118．66 |
|  | Tcをal | 2690.63 | 9775．83 | 2537.77 | 249．62 | 598.35 | 17.55 | 14970.76 |
|  | $\%$ | 17.97 | 58．63 | 3．7．6\％ | 1． 67 | 3．99 | 0.12 | 200 |

＊inrecorded relates to those potnts where information could not be collectec． Exclanato＝：note：

Regeneration ：1．e．crop telow 10 ors dianeter predominating．
Pole crop ：Crop betweer 10 to $10 s=$ than 20 cms diameter predominat－
Small timber ：Crop 20 cms to unjez 30 cns diameter predominating．
Big timber ：Tree with diometer 30 cms．and over predominatinge
Mirea size
cless
：Tree crop with no marked domination of any class．

### 4.1.9 Distribution of accessible tree forest area by regeneration status

Only $0.29 \%$ or the accessible tree forest area is having adequate regeneration. $9.19 \%$ area is having inadequate regeneration and in $89.39 \%$ area it is absent. $1.13 \%$ area remained unrecorded, in respect of this attribute. Distribution of tree forest area districtwise by regeneration status is given in the following table No.4.1.9.

Table No. 4.1.9
Accessible tree forest area: 14970.76

*Unrecorded relates to those points where information could not be collected.
EXPL:NATORY NOTE:
Adequate regeneration: fifens where 3 or more than 9 seedinngs Chaving aidmeter 2 cms to less than 10 cms at breast height? of economically inportant species were found in a regeneration plot of 16 square meter area.
Inadeguate regeneration: Meins where less than 8 seedings (having diameter between 2 cms to less than 10 cms ) of economically important species were found in a regeneration plot of 16 sq . meter area.

$77.83 \%$ of the accessible tree forest area is effected by un－natural／man－made injuries while $0.48 \%$ area is subjested to returel injuries．Injury to crop is gusent in $21.27 \%$ of the accessible tree forest erec． Distribution of accessibie tree forest area districthise by type of iniury to srop is giver in the following teble No．4．2．10．

Teble No．S．E．10
Accessible tree forest area ： 14970.76
Unit ： $\mathrm{km}^{2}$

| S. | Distaict | FHJUPIES TO GROE |  |  |  | Totas |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Nėurel | じ口 <br>  | Absent | ＊Unre co－ded |  |
| 二。 | A1wご | － | 715.44 | 337.52 | － | 1056．96 |
|  | Bharatous | 20.75 | 455.93 | 62.26 | － | 549.94 |
|  | Sunei | 15．75 | 703.63 | 117.27 | E． 32 | 846.03 |
|  | Jaipur | － | 406.50 | 154．47 | － | 560.97 |
|  | Sawai Madhopur | 34.68 | 1725.03 | 303． 39 | － | 2063.10 |
| 6. | Tont： | － | 125.79 | 16.77 |  | 142.56 |
| 7. | Chittorgarh | － | 1730.92 | 482.24 | － | 2213.16 |
|  | Xota |  | 1833.87 | 812.95 | － | 2646.82 |
|  | A．jmer | － | 221.25 | 70.40 | － | 291.66 |
| 10. | Bhilwara | － | 397.92 | 58.24 | － | 456.16 |
| 11. | Eermer \＆Jalor | － | 205.77 | 19.60 | － | 225． 37 |
| 22. | Eenswara | － | 417.61 | 95.70 | 8.70 | 522.01 |
| 13. | Dungarpur | $\checkmark$ | 265.89 | 79.77 | － | 345.66 |
| 14. | Jinal awar | － | 540.05 | 47.38 | － | 587．44 |
| 15. | Jhunjhunu | － | 112.28 | 8．02 | － | 120．30 |
| 16. | Paliz ${ }^{\text {a }}$ Udaipur | － | 702.58 | 208． 47 | 8.69 | 920.74 |
| 17. | Sikar（ショこち |  | 277.23 | 25.99 |  | 303.22 |
| $1 \varepsilon^{1}$ | Sirohz | － | 797.73 | 284.25 | 36.68 | 1118.66 |
|  | TOEal | 72.18 | 11651.44 | $3 \pm 84.69$ | 62.45 | 14970.76 |
|  | \％ | 0.48 | 77.83 | 21． 27 | 0.42 | 100 |
| ＊Un ecoried relates to those points where information coulo not be coilected． <br> EXPLALATORY NORE： |  |  |  |  |  |  |
| Injury to crop was juaged by occuiar estimation in two hectare aree around the centre of plot，nrovided the effected trees formed at least $10 \%$ of the crop． |  |  |  |  |  |  |
| Natural iniury：Means injury by wind／snow of flood，al lightenirg，wildife，borer atteck，leaf defoieetor or other pests． |  |  |  |  |  |  |
| Marmmade／Un－naturai：Means injury by grialing／illicit felling，scarring／fire，lopping． |  |  |  |  |  |  |

### 4.1.11 Distribution of accessible tree forest area <br> by forest types

$79.15 \%$ of the total accessible tree forest - area bears 'miscellaneous forest type', 7.58\% is under Teak type. $6.74 \%$ is under Khair type and $6.53 \%$ is under Selai type. Distribution of accessible tree forest area districtwise by forest type is given in the following table No.4.1.11.

Table No.4.1.11
Accessible traa for ${ }^{2}$ st area: 14970.76
Unit: $\mathrm{km}^{2}$

| Sl. DistriNo. Dister | FOREST TYDES |  |  |  | Total |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Teak | Khair | Salai | $\begin{aligned} & \text { Misce- } \\ & \text { liganeous } \end{aligned}$ |  |
| 1. Alwar | - | 71.06 | 408.57 | 577.33 | 1056.95 |
| 2. Bharatpur | - | 186.77 | - | 363.17 | 549.94 |
| 3. Sundi | - | 83.77 | 50.26 | 712.00 | 846.03 |
| 4. Jaipur | - | - | 56.91 | 504.06 | 560.97 |
| 5. Sawal Mathopur | - | 138.69 | - | 1924.41 | 2063.10 |
| 6. Tonk | - | - | - | 142.56 | 142.56 |
| 7. Chittorgarh | 456.41 | 111.95 | 68.89 | 1575.91 | 2213.16 |
| 8. Kota | 283. 59 | 378.12 | 37.81 | 1947. 30 | 2646.82 |
| 9. Ajmer | - | 20.11 | - | 271.55 | 291.66 |
| 10. Bhilwara | - | - | 19.41 | 436.75 | 456.16 |
| 11. Barmer 亠幺 Jalor | - | - | 19.60 | 205.77 | 225.37 |
| 12. Banswara | 252. 30 | - | 34.30 | 234.91 | 522.01 |
| 13. Dungarpur | 141.81 | - | - | 20.3 .35 | 345.65 |
| 14. Thalawar | - | 18.95 | - | 568.49 | 587.44 |
| 15. Jhunjhurn | - | - | - | 120.30 | 120.30 |
| 16. Pali sx Uaipur | - | - | 147.67 | 773.08 | 920.75 |
| 17. Sikar (Fart) | - | - | 51.98 | 251.23 | 303.21 |
| 18. Sirohi | - | - | 82.52 | 1036.14 | 1110.65 |
| Tota. | 1134.11 | 1009.42 | 979.42 | 11848.31 | $14970.7 E$ |
| $\%$ | 7.58 | 6.74 | 6.53 | 79.15 | 100 |

### 4.1.1.2 Distribution of accessille troe forest area (excluding plantation) by forest types and canopy density classes

Out of the total accessible tree forest area of $14970.76 \mathrm{~km}^{2}$, an area of $320.71 \mathrm{kan}^{2}$ falls under the land use "plantation". Since the canopy is not formed i.e. the canopy density is below 5 percent in such areas, these have been omitted from the analysis of area by forest types and canopy density classes. The distribution of canopied accessible tree forest area (excluding plantation) of $14650.05 \mathrm{~km}^{2}$ districtwise by forest types and canopy density classes is given in the following table No.4.1.12.

The overall average canopy density is $36.60 \%$. Out of the total area of $14550.05 \mathrm{~km}^{2}$, the 1 argest portion of $7638.74 \mathrm{~km}^{2}$ is having open tree forest (canopy density of 5 to $29 \%$ ). followed by $5416.12 \mathrm{~km}^{2}$ under inoderately dense tree forest (canopy density 30 to $69 \%$ ) and only $1595.12 \mathrm{~km}^{2}$ under dense tree forest.

## Table No. 4._L_12

Distribution of accessible tree forert area (excluding plantation) by forest typeg ard canopy density classes

Area $=14650.05$
Unit: $\mathrm{km}^{2}$

| District <br> (1) | Canopy <br> density <br> class(2) | FOREST TYPES |  |  |  | $\begin{gathered} \text { Total } \\ (7) \\ \hline \end{gathered}$ | $\begin{array}{r} \text { Density } \\ \%(3) \\ \hline \end{array}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Teak (3) | Khair (4) | $\begin{gathered} \text { Salai } \\ (5) \end{gathered}$ | $\begin{gathered} \mathrm{Misc} \\ (6) \end{gathered}$ |  |  |
| Alwar | 70\% \& above | - | - | 26.65 | 17.76 | 44.41 |  |
|  | 30 to $69 \%$ | - | 62.18 | 364.16 | 239.82 | 666.16 | 40.86 |
|  | 5 to 29\% | - | 8.88 | 17.76 | 310.87 | 337.51 |  |
| Bharatpur | 70\% \& above | - | - | - | 10.38 | 10.38 |  |
|  | 30 to 69\% | - | 51.88 | - | 103.76 | 155.64 | 25.53 |
|  | 5 to $29 \%$ | - | 134.89 | - | 249.03 | 383.92 |  |
| Bundi | $70 \%$ \& above | - | - | - | 33.50 | 33.50 |  |
|  | 30 to $69 \%$ | - | 16.75 | 33.50 | 251.30 | 301.55 | 31.90 |
|  | 5 to 29\% | - | $67.02{ }^{\prime}$ | 16.75 | 402.08 | 485.85 |  |
| Jaipur | 70\% \& above | - | - | 8.13 | 24.39 | 32.52 |  |
|  | 30 to 69\% | - | - | 32.52 | 73.17 | 105.69 | 27.31 |
|  | 5 to $29 \%$ | - | - | 15.26 | 393.37 | 114.63 |  |
| sawai <br> Madhopur | 70\% \& above | - | - | - | 225.33 | 225.38 |  |
|  | 30 to $69 \%$ | - | 34.68 | - | 728.15 | 762.33 | 36.63 |
|  | 5 to 29\% | - | 104.02 | - | 970.87 | 1074.89 |  |
| 'Tonk | 70\% \& above | - | - | - | 8.39 | 8.39 |  |
|  | 30 to 69\% | - | - | - | 25.16 | 25.16 | 27.44 |
|  | 5 to $29 \%$ | - | - | - | 100.63 | 100.63 |  |
| Chittorgarh | 70\% \& above | 232.51 | - | - | 180.84 | 413.35 |  |
|  | 30 to 69\% | 146.40 | 17.22 | 60.28 | 611.42 | 835.32 | 42.55 |
|  | 5 to $29 \%$ | 77.50 | 77.50 | 8.61 | 766.43 | 930.04 |  |
| Kota | 70\% \& above | 9.45 | 28.36 | - | 160.70 | 199.51 |  |
|  | 30 to $69 \%$ | 189.06 | 170.15 | 37.81 | 727.87 | 1124.89 | 36.54 |
|  | 5 to $29 \%$ | 85.08 | 170.15 | - | 1011.46 | 1266.69 |  |
| Ajmer | 70\% \& above | - | 20.11 | - | 60.35 | 30.46 |  |
|  | 30 to $69 \%$ | $\stackrel{ }{-}$ | - | - | 80.46 | 80.46 | 44.86 |
|  | 5 to $29 \%$ | - | - | - | 130.74 | 130.74 |  |
| Bhilwara | $70 \%$ \& above | -- | - | - | 48.53 | 18.53 |  |
|  | 30 to $69 \%$ | - | - | - | 77.64 | 77.64 | 30.13 |
|  | 5 to $29 \%$ | - | - | 19.41 | 300.87 | 320.28 |  |


| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{gathered} \text { Barmer } \\ \dot{\alpha} \\ \text { Jalor } \end{gathered}$ | 70\% above | - | - | - | - | (1) |  |
|  | 30 to 69\% | : - . | - | 9.80 | 9.80 | 19.60 | 19.87 |
|  | 5 to 29\% | - | - | 9.80 | 195.97 | 205.77 |  |
| Banswara | 70\% \& above | 8.70 | - | - | - | 8.70 |  |
|  | 30 to $69 \%$ | 113.10 | - | 17.40 | 60.90 | 191.40 | 31.44 |
|  | 5 to 29\% | 121.80 | - | 17.40 | 139.20 | 278.40 |  |
| Dungarpur | 70\% \& above | 53.18 | - | - | 17.73 | 70.91 |  |
|  | 30 to $69 \%$ | 35.45 | - | - | 53.18 | 83.63 | 40.62 |
|  | 5 to $29 \%$ | 53.18 | - | - | 115.22 | 168.40 |  |
| Jhalawar | 70\% \& above | - | - | - | 9.47 | 9.47 |  |
|  | 30 to 69\% | - | - | - | 66. 32 | 66.32 | 22.34 |
|  | 5 to 29\% | - | - | - | 454.79 | 454.79 |  |
| Jhunjhunu | 70\% \& above | - | - | - | - | - |  |
|  | 30 to $69 \%$ | - | - | - | - | - | 17.00 |
|  | 5 to $29 \%$ | - | - | - | 104.26 | 104.26 |  |
| ```Pali & Udaipur (Part)``` | $70 \%$ \& above | $-$ | - | 26.06 | 173.72 | 199.78 |  |
|  | 30 to $69 \%$ | - | - | 78.18 | 390.88 | 469.06 | 48.87 |
|  | 5 to $29 \%$ | - | - | 43.44 | 199.78 | 243.22 |  |
| Sikar ${ }^{\text {- }}$ | $70 \%$ \& above | - | - | - | - | - |  |
|  | 30 to $69 \%$ | - | - | 43.32 | 17.33 | 60.65 | 24.00 |
|  | 5 to. $29 \%$ | - | 1 - | 8.66 | 216.57 | 225.23 |  |
| Sirohi | 70\% \& above | - | - | 27.51 | 183.39 | 210.90 |  |
|  | 30 to $69 \%$ | - | - | 27.51 | 357.61 | 385.12 | 41.38 |
|  | 5 to $29 \%$ | - | - | 27.51 | 485.98 | 513.49 |  |
| Total | 70\% \& above | 303.84 | 48.47 | 88. 35 | 1154.53 | 1595.19 |  |
|  | 30 to 69\% | 484.01 | 352.86 | 704.48 | 3874.77 | 5416.12 |  |
|  | 5 to $29 \%$ | 337.56 | 562.46 | 185.60 | 6553.12 . | 7638.74 |  |
| Grand Total |  | 1125.41 | 963.79 | 978.43 | 11582.42 | 14650.05 |  |
| Density \% |  | 49.55 | 14.20 | 39.23 | 34.82 |  |  |
| Overall Density \% |  |  |  |  |  |  | 36.60 |

Note:- $320.71 \mathrm{~km}^{2}$ of tree forest area falls under the land-use 'plantation'. Canopy in such area is not formed i.e. canopy density is below 5 percent. Such area has been ornitted from this analysis.

From the above tabulation it can be concluded thet out the total accessible tree forest area (excluding plantation) as much as 52.14 percent area bears open tree forest (Canopy density 5 to $29 \%$ ) 36.97 percent area bears moderately dense tree forest (canopy density 30 to $69 \%$ and only 10.89 percent area baars dense tree forest (canopy density $70 \%$ and above).

Nmongst the forest types, the extent of area bearing dense and moderately dense tree forest (canopy density $30 \%$ and above) is highest for "Miscellaneous type" and is $5029.30 \mathrm{~km}^{2}$ followed by $792.83 \mathrm{~km}^{2}$ for "Salal type". $787.85 \mathrm{~km}^{2}$ for "Teak type" and $401.33 \mathrm{~km}^{2}$ for "Khair type".

Note: The appendix II which forms the volume $I^{1}$ of this report incorporates the list of location of centre of sample plots. This list also incorporates the important data ralating to each such sample plot like landuse classification, forest type classification, no. of tree enumeroted and volune per hectare. This information can be made use of in working out the verification of growing stock with different area stratification or at different time intervals to assess the periodic changes.

## Stand and stock tables

Distribution of total volume ( $000 \mathrm{~m}^{3}$ ) and total stems ( 000 Nos) by species and diameter classes In accessible tree forest area is yiven forest type wise in table nos IV.2.37 to IV.2.44. The position for all types combined is given in table Nos. $1 \mathrm{~V} .2 .45 \&$ IV.2.46.

Distribution of volume per heotare (stock table) and stoms per hectare (stand table) by specjes and diameter classes, in accessible tree forest area of the region, is given forest type wise in table Nos. IV. 2.47 to IV. 2.54 . The overall position in respect of all the forest types combined is depicted in the stock table No. IV.2.55 and stand table No. IV.2.56. The abstract of the forest type-wise stock and stand table is given below:-

Accessible tree forest area: $14970.76 \mathrm{~km}^{2}$

| Forest type | Total Area <br> $($ ha) | Vol./ha <br> $\left(\mathrm{m}^{3} / \mathrm{ha}\right)$ | stems/ha |
| :--- | :---: | :---: | :---: |
| Teak | 113411 | 12.937 | 119.490 |
| Khair | 100942 | 3.308 | 69.392 V |
| Salal | 97842 | 30.020 | 249.038 |
| Miscellaneous | 1184881 | 8.825 | 91.301 |
| Total | 1497076 | 10.151 | 102.270 |

The overall average figure is $10.151 \mathrm{~m}^{3}$ per hectare corresponding to 102.270 stems per hectare. These figures indicate that these forest areas are poorly stocked.

From the stand table- for all the forest types combined-it can be seen that the highest proportion of stems is of dia-class $10-20 \mathrm{~cm}$ which is 80 percent of the total . Therefore the region as a whole can be said to be predominantly bearing a pole crop.

| 4.2 .1 | Growing stock in forest types and its |
| :---: | :---: |
|  | critical aspects |
| (i) | Toak forest type |
|  | This forest type occurs over an area of |
|  | $1134.11 \mathrm{~km}^{2}$ out of a total of $14970.76 \mathrm{~km}^{2}$ of |
|  | accessjble tree forest area thus accounting |
|  | for 7.58\% of the area. The overall average |
|  | canopy density in tinis forest type is 49.55\% |
|  | and is bighest anongst all the forest types. |
|  | The average growing stock per hertare, in |
|  | this forest type, iss 12.937 cubic Inetres. |
|  | Teak accounts for 23.6 percent of the totel |
|  | growing stock (volume) corresponaing to 40.7 |
|  | percent of total stems, in this type. |
|  | Other prodominant trea species, by volume, in this corest type are Lannea coromandelica 12 |
|  | this Lorest type are Linnes coiomandelica 12. percent, Anogeissus latifolia 9.4 percent, |
|  | Diospyros melanoxylon 6.7 percent, Boswelifa |
|  | serrata 5.0 percent and Miscellaneous species 37.1 percent. |
| (11) | Khail forest type |

This tvpe ocours over an area of $1009.42 \mathrm{~km}^{2}$ 1.e. 6. 74 percent of the total accessible tree forest area. The overall avorage camopy density. in this type, is 14.20 percent. Average growing stock per hectare is only 3.308 cubic metres ant is lowest amongst the four forest types of this region. Khair(Acacia catechu) accountis for 39. 3. percent of the growing stock (volume) corresponding to 70.4 percent of total stems, in this type.

Other predominant tree species, by volume, in this type are Boswellia serrata 13.9 percent, Arogeisaus latifolia B. 6 percent, Diospyros melanoxylor 5.3 percent and iniscellaneous species 23.4 percent.
(iii) Salai forest type

Ihis type occurs over an area of $978.42 \mathrm{~km}^{2}$ 1.e. 6.53 percent of the total accessible tree forest area. lhe overall jverego canopy density, in this type, is 39.23 percent. Average growing stock per hectare is 30.020 cubic metres and is highest amongst all. tie fisiost types enlisted in this region. Salai (Hoswcilia serrata) accounts for 83.3 percent $c$ f the growing stock (volume) corresponding to 70.7 percent of tutal stems. in this type.

Other predominant tree species by volume in this type are Lannea coromandelica 5.7 percent and miscellaneous species 4.7 percent.

## (iv) Miscellaneous forest type

This forest type occupies the largest area anongst the four types of this region and occurs over an area of $11848.81 \mathrm{~km}^{2}$ i.e. 79.15 percent of the total accessible tree forest area. The overall average canopy density, in this type, is 34.92 percent. Average growing stock per hectare is 8.825 cubic metres. In this forest type Dhok (Anogeissus pendula) constitutes the largest. component amongst the various tree species and accounts for 19.2 percent of the growing stock by volume ( 36.2 percent by number of stems). It is followed by Lannea coromandelica 12.7 percent (by volume). Boswellia $\quad$ etrrgta 12.0 percent and miscellaneous species 42.1 percent.

For all the forest types combined the highest number of stems, of a single tree species, are that of $A$. pendula(dhok) and are assessed at 40.78 milli ion stems corresponding to a volume of 2.08 million cubic metres. This is followed by B. serrata(Salai) assessed at 2.2 .36 mflli ion stems corresponding to 3.32 inillion cubic metres. The overall standing stock ofi Tectona grandis(teak) is assessed at 9.25 million stens 1.e. 0.52 million cubic metres.

### 4.2.2 Analysis of growirg stock in districts

The total volume in thousand cuibic metres as well as volume per hectare and total stems in thousands as well as stems per hectare by species and diameter classes, districtwise, is given in tables no. IV.2, to IV. 2,36 These tables are. given at the end of this Chapter. The abstract of these tables is given below:

Stratum : Rajasthan Survey area
Accessible tres:
forest arsa: $14070.75 \mathrm{~km}^{2}$
S.No. District

Area Vol./ha

|  | (ha) | $\mathrm{m}^{2} / \mathrm{ha}$ | Stems/ha |
| :---: | :---: | :---: | :---: |
| 1. Alwar | 105696 | 20.437 | 230.840 |
| 2. Bheratpur | 54994 | 1. 251 | 39.033 |
| 3. Bundi | 84603 | 7.101 | 77.683 |
| 4. Jaipur | 56097 | 6.018 | 99.652 |
| 5. Sewai Madhopur | 206310 | 6.138 | 96.695 |
| 6. Tork | 14256 | 7.713 | 92.500 |
| 7. Chittorgarh | 221316 | 12.732 | 110.039 |
| 8. Kota | 264682 | 9.078 | 86.787 |
| 9. Ajmer | 29166 | 4.082 | 63.103 |
| 10. Bhilwara | 45616 | 6.179 | 65.957 |
| 11. Barmer \& Jalaur | 22537 | 5.326 | 72.771 |
| 12. Banswara | 52201 | 12.066 | 84.500 |
| 13. Dungarpur | 34566 | 13.099 | 90.512 |
| 14. Thalawar | 56744 | 3.973 | 31.613 |
| 15. Jhunjhunu | 12030 | ᄃ. 160 | 70.714 |
| 16. Fali \& Udaipur | 92075 | 16.607 | 135.433 |
| 17. Sikar (Part) | 30321 | 6.984 | 95.257 |
| 18. Sizohi | 111866 | 15.975 | 123.075 |
| Total | 1497076 | 10.151 | 102.270 |

From the data tabulated above it can be seen that amongst the districts the average volume per hectare varies from $1.251 \mathrm{~m}^{3}$ in Bharatpur to $20.487 \mathrm{~m}^{3}$ In Alwar district. The number of stems per hectare vary from the lowest of 31.613 in Jhal awar to the highest of 230.340 ir. Alwar district.

The total growing stock standing in the accessible tree forest area is assessed at 15.20 million cubic metres corresponding to 153.11 miliion stems. The overall average volume per hectare is $10.151 \mathrm{~m}^{3}$ and the number of stems per hectare is 102.270.

### 4.3 Bamboo area and Inventory

In the region under survey, the bamboo has been assessed to be occuring only in the overlapping form - i.e. overlapping with tree forest and in an area of $529.44 \mathrm{~km}^{2}$. The bamboo species found in the region is Dendrocalamus stricteus.
4.3.1. The districtwise distribution of bamboo bearing area (overlapping with tree forest) is given below in table 4.3.1.

Table No. 4.3 .1

| S.NO. | District | No. Of Plots | Bamboo area <br> (Overlapping) $\left(\mathrm{km}^{2}\right)$ |
| :---: | :---: | :---: | :---: |
| 1. | Alwar | 9 | 79.416 |
| 2. | Chittorgarh | 38 | 335.312 |
| 3. | Sirohi | 13 | 114.712 |
|  | Total | 60 | 529.440 |

Note:- The total forest area of the se three districts is $5497.57 \mathrm{~km}^{2}$ and the total number of plots in these is 623 (refer table 4.1). Thus the average area per plot, for these three districts is $8.824 \mathrm{~km}^{2}$. This value has been used in the tabulation above (table 4.j.1).

It is evident from the above table that reliabie districtwise results in respect of bamboo cannot be given in respect of two of these three districts, 1.e. the districts of Alwar and Sirohi, because of insuffictent number of plots in these. Hence in the subsequent tables the bamboo data has not been analysed separately for the districts.
4.3.2. Distribution of Bamboo area by quality classes

Area : $529.440 \mathrm{~km}^{2}$
No. of plots : 60

| Quality Class | No. of <br> plots | Area <br> $\left(\mathrm{km}^{2}\right)$ | $\%$ |
| :--- | :---: | :---: | :---: |
| I | 27 | 238.248 | 45 |
| II | 15 | 132.360 | 25 |
| III | .18 | 158.832 | 30 |
| Total | 60 | 529.440 | 100 |

Out of $529.440 \mathrm{~km}^{2}$ of overlapping bamboo
area, $45 \%(238.248 \mathrm{~km} 2)$ is of I quality $25 \%$
$(132.360 \mathrm{~km} 2)$ is of II quality and $30 \%(158.832 \mathrm{~km} 2)$
is of III quality.

## * Bamboo auality class <br> Description

I

II

III

IV

Average culm height 5 metres of more for Dendrocalamus strictus and 14 metres or more £1 for Bambusa arundinnacea.
Average culm height 4 metres or more but less than 6 metres for Dendrocalamus strictus and 10 metres or more but less than 14 metres for Bambusa arundinacea.

Average culm height of 2 metres or more but less than 4 metres for Dendrocalamus strictus and two metres or more but less than 10 metres for Bambusa arundinacea.

Regeneration crop.
4.3.3. Distribution of Bamboo area (overlapping) into, "Hacked" and "Non-Hacked" categories.

Out of the total bamboo overlapping area assessed at 529.440 km 2 an area of 217.776 km 2 has been assessed to be of completely hacked category (i.e.Bamboo present but completely hacked) and therefore does not contribute to the bamboo inventory of the region.

- The balance area of $317.664 \mathrm{~km}^{2}$ is assessed to be of category Non-hacked and this is the area solely contributing to the bamboo inventory of the region.
4.3.4 Mean number of Clumps/ha.

The size class-wise distribution of clumps per hectare, for the "Hacked" and "Non-hacked" categories of bamboo overlapping area is given below in table No. 4.3.4.
Table 4.3.4. Unit Clumps/ha

| S.NO. | Category of Bamboo overlapping area. | 1. | $\begin{array}{r} \text { size } \\ 2 . \\ \hline \end{array}$ | $\begin{gathered} \text { sses } \\ 3 . \end{gathered}$ | Total |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1. | Hacked area (211.776 km ${ }^{2}$ | 22.92 | 11.25 | - | 34.17 |
| 2. | Non Hacked area ( 317.664 km 2 | 50 | 30.28 | 4.72 | $85^{\circ}$ |

On the basis of above tabulation, the total number of bamboo clumps in assessed at 7.24 lakhs in "Hacked" area and 27.00 Lakhs in the"non hacked" bamboo area. 4.3.5 Mean number of culms per clumps by size classes.

The mean number of culms per clump vary according to the size class of the clump and these have been assessed for the "Non-hacked" bamboo overlapping. drea only. The distribution is given below:-
Size Class
1.
2.
3

Mean number of culms/clump 20 31
66 (Based on one clump sample only).

## *Clump size Class <br> 1.

2

3

## Description

Small All clumps with less than 1 metre average diameter.
Medium Clumps of average diameter between 1 metre to less than 2 metres. Clumps of average diameter 2 metres and over.

Further analyses of number of culmos per clump and Bamboo stock (Tonnage)-given in the following tables is only in respect of the "Non-hacked" bameoo overlapping area ( $317.664 \mathrm{~km}^{2}$ ).
4.3.6 The clump size class wise distribution of total number of culms (in oo ) by foundness is given below in table NO.4.3.6.

Table 4.3 .6

| $\begin{aligned} & \text { Clump } \\ & \text { size } \\ & \text { class. } \end{aligned}$ | Green Sound | Green damaged | Dry Sound | Dry <br> damaged | Decayed Total No. of Culms |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1. | 11,809 | 5,248 | 6,008 | 4,143 | 4,489 31,697 |
| 2. | 10,288 | 4,516 | 4,600 | 5,060 | 5,395 29,859 |
| 3 | 4,798 | 3,149 | 900 | 1,049 | 0 9,896 |
| Total Sige es. | $\begin{aligned} & \text { f } \\ & \text { ss- } \\ & 26,895 \end{aligned}$ | 12,913 | 11,508 | 10,252 | 9,884 71,452 |
| Percen | ge 37.6 | 18.07 | 16.11 | 14.35 | 13.83100 |

Total number of culms in the non-hacked bamboo (overlapping) area is 71.452 million. To obtain the equivalent number of sound colms, the following criteria is used.

Damaged culms $=1 / 2$ sound culm.
Decayed culms are considered to contribute nothing to the bamboo inventory. For the purpose of numbers green and dry culms are taken to be equal. On the basis of this criteria the total equivalent sound culms are 49.986 million ( $69.96 \%$ ).
4.3.7 The clump size classwise distribution of total culms ( in 000) by age is given below in table 4.3.7.

Table No. 4.3.7

| $\begin{aligned} & \text { Clumps } \\ & \text { size } \\ & \text { class } \end{aligned}$ | Current year culms | One to two season old culms ( 2 to $\angle 5 \mathrm{~cm}$ ) | $\begin{aligned} & \text { Over two } \\ & \text { seasons } \\ & \text { old } \\ & 12 \text { to } \angle 5 \end{aligned}$ | Decayed <br> m) | Total <br> No. of <br> Culms |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1. | 4350 | 2831 | 20027 | 4,489 | 31,697 |
| 2 | 1589 | 5395 | 17480 | 5,395 | 29,859 |
| 3. | 1649 | 2250 | 5997 | - | 9,896 |
| Total all siz | 7.588 | 10,476 | 43,504 | 9,884 | 71,452 |

all size
classes

Note:- As per the data collected no culm of size 5 cm dia and over has been recorded.
4.3.8 Bamboo Stock in Tonnes.

The total number of bamboo culms are assessed at 71.452 Million -in number- and these have been classified as per age ( and size) in the table No.4.3.7. The total equivalent sound culms are 49.986 million.

The overall average green weight per culm ( $\mathrm{PO}_{\mathrm{c}} \mathrm{culn}$ dia size $2 \cdot \mathrm{~cm}$ to $\angle 5 \mathrm{~cm}$ ) and therefore the total green weight of bamboo stock is assessed to be $164: 154$ thousand. Tonnes ( 49.986 mllilion culms).

On the basis of data collected during the survey work the average value of driage is $60.61 \%$. Therefore the total dry weight stock of bamboo is 99.494 thousand tonnes.


The S.E. percent for the whole region is 4.14 percent in respect of the assessed growing stock (volume).

$\sim$
14743.894 4<2, 772 15196.61




by da Classes in accessible Tree Forest Area. Unit $:$ eccervi is in确


Distribution of Total Volume by Species and diameter Classes and Volume per hactare

| S1.No. | Species name | $10-20 \quad$ DINMETER CLASSES (1n cms) |  |  |  |  | TotaI | $x$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1. | Acheia catechu | 24.493 | 11.633 | - | - | 10.631 | 47.257 | 3.73 |
| 2. | Acheia species | 7. | 19.480 | 5.081 | 13518 | 12.959 | 58.529 | 4.62 |
| 3 | Ancogusiur bindula | 495.185 | 142.952 | 37.576 | 5:243 | 9.317 | 710.273 | 56.08 |
| 4. | Borwastlia |  | 18.806 | 7.3 | -- | - | 32.463 | 2.56 |
| T | Dicapyrex materexylen | 6 | 11.026 | 14.965 | - |  | 32.743 | 2.59 |
| 6.1 | a | 3.907 | 5.355 | 7.07 | 6.263 |  | 32.600 | 2.5 |
| 7. M | Mixc - species.s | 100.259 | 93.796 | 90.0 | . 8 | 2.568 | 352.576 | 27.84 |
|  | Total | 644.863 | 323.048 | 162.16 | 80.89 | 5475 | 1266.441 | 100 |
|  | voil 1 | 3.125 | 1.566 | . 786 | . 392 | 0.269 | 6.138 |  |
|  | \% | 50.912 |  |  |  | 4 | 100 |  |


by ala clagses in accessible tree forcest Area.
Distribution of Total Volume by species and diameter Classes and volupe per tractare
Dsatrict: Chittorganl.
Aseg
Unte


[^1]\[

$$
\begin{aligned}
& \text { Elstrict: Kola } \\
& \text { Area : } 26468 \mathrm{E} \\
& \text { Untt: } 0.00 \mathrm{~m}^{3}
\end{aligned}
$$
\]




Contents
by da classes in accessible free forest Area.
DLatribution of Total Volume by Species and dinater Classes and Volupe per hactare
Diotricts Jules \& Ban verw

## by dia Clasgen in accessible treo Forcot Arca.

## Table Ho, N. 2.11

| by dia Clasger in acceaslble treo forcat arca. <br> Diotricts <br> Area : <br> Unit: |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |
|  | Specios Name | PIAMETER C L A S E S (incmge) |  |  |  |  |  |  |
| 1 | Acaciacatecte | 4.654 | 1.060 | 3.92 .3 | - | - | $9.60{ }^{\circ}$ | 8.01 |
| 2 | Acacir $\mathrm{Sb}^{\text {bexus }}$ | $3 \cdot 002$ | - |  |  | - | $3 \cdot 602$ | 2.50 |
| 3 | Amogcissuspendily | $8 \cdot 6,99$ | - |  | - | - | 5.699 | 7.25 |
| 4 | Bosueccio lerset | C. Cz | .14.501 | 6.744 | 8.861 | - | 36.108 | 30.08 |
| 5 | downecorsumade: | 7.962 | 5.361 | - | - | - | $13 \cdot 2.23$ | 11.01 |
| 6 | Miso,spoecs | 39.717 | 2.714 | 16.589 | - | . - | 49.3910 | 41.15 |
|  | Total | 59.906 | $23 \cdot 636$ | 27.626 | 8.861 | - | $120 \quad 029$ | 100 |
|  | Vod/la. | - 6.58 | 1:049. | 1.2.26 | 0:393 | - | $5 \cdot 396$ |  |
|  | $\cdots \%$ | 49.91 | .19 .64 | $\lambda 3^{3} 0$ | 138 | - | 100 |  |



Table No. DV 214
Distribution of Total Volume by Species and Diameter Classes and Volume per hactare

Table No. TV. 2 - 15

| by dia classes in accessible miee Forest Area. |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | District : Thusifhumu <br> Area: 12030 tha. <br> Unit: $000 \mathrm{~m}^{3}$. |  |  |
| S1.NO. Species Name | DIAMETER CLASSES (incms.) |  |  |  |  |  |  |
|  | 10-20- | 20-30 | 30-40 | 40-50 | 50 \& above | Total | \% |
| 1. Acacia speciex | 3.405 | 1.379 | - | - | - | 4.784 | 7.70 |
| 2. Ancgeissus pindula | 1. 676 | - | - | - | - | 1.676 | 2.71 |
| 13 Bosurilia sursorta | 12.405 | 15.806 | - |  |  | 28.211 | 45.4.4 |
| 4. Mise spacias | 15.850 | 3.351 | $\because 8.209$ |  |  | $27.410^{\circ}$ | 44.15 |
| Toted | 33.336 | 20.536 | E. $200_{1}$ | - | - | 62. cel | 100 |
| vol./ ha. | 2.771 | 1.707 | 0.682 | - | - | 5. 160 |  |
| \% | $53^{-70}$ | 3368 | 13.22 |  | - | 100 |  |

Table Ho. TV 2. 16
Distrebution of rotal Volume by Species and Dlameter Classes and Volune per hactara

Distribution of Total Volume by Species and Blameter Classes and Voluee per hactare

| 51.10 | Spectes RIapa |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 10=20 | 20-30 | 30-40 | 40.50 | 50 \& above | Totel | \% |
| 1 | Acacia speries | 4.174 | - | - | - | - | 4.174 | 1.37 |
| 2 | Anugeidsus perdula | 24.979 | 11.465 | 6.027. | - | - | $42 \quad 471$ | 20.06 |
| 3 | Borlitilia ferrata | 45.184 | 41.565 | $5 \cdot 579$ | - | - | 92.328 | .43 .60 |
| 4 | Atespyros omelainixy Con | 0.806 | - | - | —. | - | $0.8=6$ | 0.35 |
| 5 | Lanmes carromardelice | 2.973 | 2.928 | $3 \cdot 851$ | - | - | 6.782 | $4 \cdot 62$ |
| 6 | MASE SDECILS | 22.459 | 16.655 | 12.052 | 11.018 | - | 62.194 | 29.37 |
|  | TSEC | 100.575 | 72613 | 27.549 | 11.015 | - | 211.755 | 100 |
| ata | $1, \theta / h a$ | $3 \cdot 317$ | 2.395 | c. 9.109 | -0.35s | - | 6.984 |  |
|  | \% $\%$ | 47.50 | 34.29 | 13.01 | $5 \cdot 20$ | - | 100 |  |

Distribution of Total Volume by Species and diameter Classes and Volume per hactare by dia Classes in accessible Tree Forest Area.
-68

| 31. No. | Species Name | $10-20$ | $\frac{\text { D I A M E }}{20=30}$ | $\frac{\text { T E R }}{130-40}$ | $\frac{L A S S E E}{140-50}$ | $\frac{\mathrm{S}}{50 \& \text { in cas }}$ | Total | \% |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1. | Acasue estaclu | 0.468 | 1.010 | - | - | - | 1.478 | 0.08 |
| 2 | Accicica spatien | 6.282 | 3,255 | '2.4.78 | - | - | 12.015 | 0.67 |
| 3 | Ancgaixgux latifelin | 46764 | 25.390 | 5.090 | - | - | 77.244 | $4.32$ |
| 14. | Ancopissux princludu | 44.969 | 11.619 | - | - | - | 56.588 | 3.17 |
| 5 | Beswistic sirreit. | 32.937 | 82.481 | 179.595 | 107.272 | 14.100 | 416.385 | 23:30 |
| 6. | Dioapigrea molumuxy len | 13786 | 2.489 | 4.130 | - | - | 20.405 | 1.14 |
| 7. |  | $56 \quad 344$ | 104.524 | $6 \cdot 3242$ | 22.473 | - | $\cdot 248.588$ | 13.91 |
| 8 | Wriglita timatorim | 34.941 | 14.999 | - | - | - | 49.990 | 2.80 |
| $c_{1}$ | Mixe. spacier | 257.674 | 201.405 | 145.833 | 121.804 | 177.671 | 404.387 | 50.61 |
| $\checkmark$ | T.etad | $4 C_{1} C_{6} \quad 215$ | $447 \cdot 177$ | 400.368 | $25 i .549$ | 191.771 | 1787.0 | 100 |
|  | vot/bu. | $4 \cdot 436$ | 3697 | 3.579 | 2.249 | 1.714 | 15.975 |  |
|  | $\%$ | 27.77 | 2502 | 22.40 | 14.08 | $10 \cdot 73$ | 100 |  |




Tsble A0. IV 2.22


Tabie No. $\overline{\text { IV }} 2.2 .3$
$\frac{\text { Distribution of total stems by species and diameter classes and }}{\text { stens per hectare by dia classes in accessibie tree forest area }}$


| S. | Spectes Name | $\frac{\text { DI }}{\text { d }}$ (10-20 | $\frac{20-30}{}$ | $\frac{(1 n ~ c m s) ~}{30 \mathrm{~m}} \mathbf{4 0}$ | 40-50 | 50\&above | Total | \% |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Acciec Cainchm | $1022.625$ | $96$ |  | - | S 787 | 1127.836 | 5.65 |
| 2 | Arasca Specis | 2 | 123.02 | 17.574 | $17.574$ | 8.787 | 448.028 | 25 |
| 3 | Ancycissus | $35+4.6109$ | $949$ | S7.872 | 8.787 | 8.787 | 29.08 | 74.84 |
| 4 | Brsweilersos, | 114233 | 87.57 | $17.57$ |  |  | 219.679 | 1.10 |
|  |  | 212.106 | 61510 | $26.3$ | $=$ |  | $289.9$ | 1.45 |
| 6 | Ciximatade | 79.055 | 2t 361 | 17.574 | 7. |  | 140.594 | 070 |
| 7 | Mise specios | 1915504 | 544.51 | 245.92 | 70.298 | 17.574 | 2794.110 | 14.01 |
|  | Totad | $17489.235$ | $1859069$ | $412.87$ | $114.233$ | $43935$ | 9949.304 | 100 |
|  | Stus/hro | S 4.772 | $9 \cdot 1.56$ | $2 .$ | $0.55$ | $0.213$ | 96.696 |  |
|  | \% | 84.67 | 9.47 | 2.0.7 | 0.57 | 0. 22. | 100 |  |

## Tablannan. N. 2-24

 7r78 70 artrict: TonkArea : $14256 \mathrm{Ra} . \quad \mid$
Unit : 000 Stems

| S. | Species Name | $\frac{\text { DIA }}{10-20}$ | $\frac{\text { TER CLASS }}{20-30}$ | $\frac{\operatorname{ES}(\ln \mathrm{cms}}{30-40}$ | 40-50 | 50kabove | Total |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Acacin caterkin | 7. ${ }^{\text {g }}$ /8 |  | - |  |  | '1.278 | $5 \cdot 41$ |
| 2 | A. | 1278.199 |  | - |  |  | 178.199 | 13.51 |
| 3 | Amogeissus. prendua | 69.3 .699 |  |  | - |  | 623.699 | 47.30 |
| 4 | Beswillia serrata | 53:460 | 26.729 | 17.819 | 8.990 |  | $106 \cdot 918$ | 8. 11 |
| 5 | Mise Sheoces | 240.567 | 53.459 | 26:729 | 8.910 | 8.910 | 338.577 | 26.67 |
|  | Total | 1167.205 | 80.188. | 44.548 | $17 \cdot 930$ | $8 \cdot 910$ | 1318.671 | 100 |
|  | Sterny ha. | 818875 | 5.625 | 3. 125 | 11250 | 0.695 | 92.500 |  |
|  | $\%$ | 58.51 | 6.08 | 3.38 | 1.35 | 0.68 | 100 |  |


Table No. TV. 2.26
Dfstribution of total stems by species and di ameter classes and
District Kota ! Area : 264682 hal.

| $\begin{aligned} & \dot{3} \\ & \sum_{3}^{2} \\ & \dot{1} \\ & 0 \\ & 0 \end{aligned}$ |  | y $\sim$ 0 0 | N 0 0 | 0 <br> 0 <br> $\dot{j}$ <br>  | [1 | ! ${ }_{0}^{0}$ | $\begin{aligned} & \\ & J \\ & u \\ & \dot{U} \end{aligned}$ | $\begin{aligned} & \dot{N} \\ & \underset{N}{\Gamma} \\ & \dot{\Gamma} \end{aligned}$ | $\begin{aligned} & \dot{J} \\ & \dot{j} \end{aligned}$ | $\begin{aligned} & J \\ & ! \\ & \vdots \\ & 0 \end{aligned}$ | $\begin{aligned} & \sigma^{7} \\ & 0 \\ & \stackrel{m}{m} \end{aligned}$ | $\begin{aligned} & 1 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| - |  | $\begin{aligned} & \mathrm{N} \\ & \underset{J}{\mathbf{J}} \\ & \mathrm{~J} \\ & \mathrm{~N} \\ & \mathrm{~N} \end{aligned}$ | M $\cdots$ $\cdots$ 0 0 0 | - 0 0 5 0 |  | $\begin{aligned} & - \\ & \infty \\ & 6 \\ & \infty \\ & 0 \end{aligned}$ | $\begin{gathered} \dot{J} \\ o \\ \sigma \\ \dot{\sigma} \\ \frac{\sigma}{d} \end{gathered}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & 0 \\ & \underline{N} \\ & \underline{\sim} \end{aligned}$ | $\begin{aligned} & N \\ & N \\ & N \\ & N \end{aligned}$ | $\begin{aligned} & \Gamma_{0} \\ & i \\ & j \\ & 0 \\ & \Gamma \end{aligned}$ | $\bar{n}$ 0 $\underset{\sim}{0}$ $\dot{N}$ $N$ | $\begin{aligned} & \Gamma \\ & \Gamma \\ & \Gamma \\ & \infty \\ & \infty \end{aligned}$ | O |
|  | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $1$ |  | $1$ | $\begin{aligned} & \text { If } \\ & \frac{1}{4} \\ & e \end{aligned}$ | $6$ |  | $\begin{gathered} 10 \\ 5 \\ 50 \\ 0 \end{gathered}$ | 1 | 1 | $\begin{aligned} & 5 \\ & u \\ & j \\ & 0 \\ & 0 \\ & N \end{aligned}$ | $\begin{aligned} & \sigma_{1} \\ & 0 \\ & n \\ & i n \\ & N \end{aligned}$ | $\begin{aligned} & \mathrm{N} \\ & \dot{0} \\ & 0 \end{aligned}$ | $\cdots$ |
|  | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & \hline \end{aligned}$ |  |  |  | $\begin{aligned} & \bar{\sigma} \\ & \underline{\sigma} \end{aligned}$ | 1 : |  | $\begin{gathered} 0 \\ 0 \\ 0 \\ 0 \\ N \end{gathered}$ | 1 | 1 | 0 00 0 0 4 | $\begin{gathered} \text { M } \\ \pm \\ \dot{N} \\ \stackrel{N}{N} \end{gathered}$ | 4 0 0 | O + -1 |
|  |  |  | $1$ | $\begin{aligned} & \infty \\ & \underset{0}{\infty} \\ & \underline{0} \end{aligned}$ | $\begin{aligned} & 0 \\ & \text { M} \\ & 0 \\ & \text { ה } \\ & \text { in } \end{aligned}$ | $\begin{gathered} \bar{i} \\ \frac{0}{0} \\ \dot{b} \end{gathered}$ | $\begin{aligned} & \Gamma_{1}^{1} \\ & \stackrel{1}{5} \\ & \dot{J} \end{aligned}$ | $\begin{aligned} & n \\ & f \\ & \dot{f} \\ & \text { j } \end{aligned}$ | $\begin{aligned} & 10 \\ & 0 \\ & \sigma \\ & \infty \\ & \hline \end{aligned}$ | 1 | $\begin{aligned} & 5 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & j \end{aligned}$ | $\begin{aligned} & \bar{\sigma} \\ & \sigma_{\dot{\prime}} \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \frac{\sigma}{J} \\ & m \end{aligned}$ | $J$ 0 $n$ $n$ |
|  |  | $\begin{aligned} & \text { in } \\ & \text { C } \\ & \text { C } \end{aligned}$ | 1 | $\begin{aligned} & \underline{1} \\ & \Gamma \\ & \pm \end{aligned}$ |  | $\begin{aligned} & \sigma \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \frac{m}{6} \\ & 0 \\ & ल \\ & m \end{aligned}$ | $\begin{aligned} & \text { m } \\ & 0 \\ & 0 \\ & \mathrm{o} \\ & \mathrm{j} \end{aligned}$ | $\begin{aligned} & \underset{\sim}{0} \\ & \dot{\sigma} \\ & \infty \end{aligned}$ |  | $\begin{gathered} \tilde{\sigma}_{0}^{1} \\ \sigma_{0} \\ \underline{1} \\ \underline{I} \end{gathered}$ | $\begin{aligned} & \square \\ & \hat{A} \\ & \hat{N} \\ & \underset{N}{N} \\ & \stackrel{N}{n} \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & \mathbf{y} \end{aligned}$ | $\begin{aligned} & 10 \\ & \underset{\sim}{1} \\ & \underset{\sim}{0} \end{aligned}$ |
|  |  | $\begin{aligned} & 5 \\ & \hline 6 \\ & 6 \\ & 6 \\ & 6 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \text { on } \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & n \\ & \dot{G} \\ & \dot{J} \end{aligned}$ | $\begin{aligned} & 8 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{aligned} & \bar{\infty} \\ & \underset{N}{N} \\ & N \\ & m \end{aligned}$ | $\begin{aligned} & \text { T } \\ & \text { N } \\ & \text { Ni } \end{aligned}$ | $\begin{aligned} & \frac{1}{寸!} \\ & \bar{\sigma}! \\ & 5 \\ & 0 \end{aligned}$ | $\begin{aligned} & \text { n } \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & m \end{aligned}$ | $\begin{aligned} & J \\ & \mathcal{J} \\ & \text { N } \\ & \frac{\mathrm{I}}{\mathbf{N}} \end{aligned}$ | $\begin{aligned} & \text { 19 } \\ & 9 \\ & \infty \\ & \underline{6} \\ & 5 \end{aligned}$ | $W$ <br>  <br>  | $\begin{aligned} & \infty \\ & \stackrel{\infty}{\dot{f}} \dot{\dot{r}} \end{aligned}$ |
|  |  | -3 |  |  |  | $\begin{array}{r} 5 \\ 6 \\ 3 \\ 3 \\ 3 \\ 3 \\ 3 \\ 3 \\ 2 \\ 0 \\ 0 \\ \hline \end{array}$ | Diospyros malanoxylom | Lemmela coromandetalica |  | Wrightia timctoria | $\begin{gathered} x \\ \cdot \frac{d}{j} \\ 0 \\ i n \\ i \\ i \\ i \\ i \end{gathered}$ | $\frac{8}{6}$ | $\frac{3}{3}$ | $1^{\infty}$ |
|  | [is |  |  | ! |  | 近 | 0 |  | $\infty$ | $\sigma$ | O |  |  |  |


| $8$ | Spectien Name | $\frac{\text { DIAMETEER }}{10-20}$ | $\frac{\text { ClasSES }}{20}$ | $\frac{\ln (\mathrm{cn} 9)}{30-40}$ | 40-50 | 50ngbove | Total | x |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1. | Acacia catochu | 372.060 | - | - | - - |  | 37206 | 20.22 |
| 2 | - Acacea species | $40 \cdot 229$. | . 30.172 | 16.057 | - | - | 80.458 | 4.3'1 |
| 3 | .... Amogeissus pendula | 673.845 | 60.344 |  | - |  | $7734 \cdot 189$ | 39.89 |
| 4 | Boswella serrata. | $60 \cdot 344$ | 30.172 | $30 \cdot 12$ | $10 \cdot 057$ |  | $130 \cdot 745$ | $7 \cdot 10$ |
| 5 | Liamea iotomandelia | $20 \cdot 114$ | $10 \cdot 057$ | $10 \cdot 057$ | - |  | $40 \cdot 225$ | $2 \cdot 6$ |
| 6 | Mise species | 472. 685 | - | 10.057 | - |  | $482 \cdot 745$ | 26.23 |
|  | Total | 1639280 | $130 \cdot 745$ | 60.343 | 10.057 | - | 1816.425 | 100 |
|  | Stems/ ha | 56.205 | 4.483 | 2.069 | 0.315 | - | $\therefore 6.102$ | 6 |
|  | $\%$ | $890 \%$ | 710 | 3.28 | 0.55 |  | 100 |  |

Table Ro. IV 2.28

Area : 45616 ha. 1

| B. | Sopcier Mamo | $\frac{\text { DY AMETER }}{10=20}$ | $\frac{\text { CIASSES }}{20-36}$ | $\frac{4 \mathrm{cma}}{30} \frac{10}{30}$ | 40-50 | 50cehovo | 2otal | \% |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Acacia catrcion | 271.754 | 29.116 | - | - | - | 300.870 | 10.00 |
| 2 | Acaces Specis | $155 \cdot 288$ | - | - | - |  | 155.288 | 5.16 |
| 3 | Anogeisins Catitutie | 262.049 | 19.411 | - | - | - | 281.460 | 9.36 |
| 4 | Awojxisus pendul: | $854 \cdot 088$ | 77.644 | - | - | - | 931.732 | 30.97 |
| 5 | Bo.bwilia seirsta | - | 29.116 | 38.8292 | 19.410 | - | 87.348 | 2.90 |
| 6 | ro. mela | 1641993 | 29.116 | - | - | - | 194.109 | 6.45 |
| 7 | Lemnee Circmamdelice | $145.58 \%$ | 38.822 | - | - | - | 184.404 | 6.13 |
| 8 | Mise specel | 582333 | 74.700 | 77.644 | 19,411 | 19.410 | 873.498 | 29.03 |
|  | ital | 36.087 | 397.925 | 116.466 | 38.8×1 | 19.410 | 3008.74 | 100 |
|  | Staus/ha | 53.404 | . 8.723 | 2.553 | 0.851 | 0.426 | 6.9557 |  |
|  | $\%$ | S097 | 13.23 | 3.87 | 1.29 | 0.64 | 100 | ? |

Teble No. IV. 2.29 .
Digtribution of total atemg by goecies and diemeter classes and
Ifems per hectarg by din chasson in accessible tree forast area.
and and
istrict: Jator $\times$ Barmer
Aren : 22537 ha .

| $\begin{aligned} & 3 . \\ & 20 . \end{aligned}$ | Spect en Nsue | $\frac{\text { DIAMETER }}{10-20}$ | $\frac{\text { CLASSES }}{20-70}$ | $\frac{10, \text { ens }}{30-40}$ | 10-50 | 30sebove | Total | x |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Acacia catechu | 161.420 | 10.830 | 10.830 | - | - | 183.080 | 11.16 |
| 2 | Acacia species. | 106.240 | - | - | - | - | 106.240 | 6.48 |
| 3 | Aregeissins pxudula | 259.920 |  | - | - | - | 259.9.20 | 15.85 |
| 4 | Boxwellia serrata | 98.000 | 50.029 | 9.800 | 9.800 | - | 167.629 | 10.22 |
| 5 | - Lammea coromeundelica | 151.120 | 30.430 | - | - | $\cdots$ | 181.550 | 11.07 |
| 6 | Misc specias | 678.699 | '20.630 | 42.290 | - |  | 741.619 | 45.22 |
| , | Totat | 1455.399 | 111.919 | 62.920 | 9.800 | - | 1640.038 | 100 |
|  | Stems/ha. | 64.578 | 4.986 | 2. 292 | 0.435 | - | 72.771 |  |
|  | $\%$ | 88.74 | 6.82 | 3.84 | 0.60 | - | 100 |  |

Table No. TV.2-30
Distribution of total stems by species and diameter classes and
stems per hectare by dia classes in accessible tree forest area.



Table No. IV $2 \cdot 32$

$$
\begin{aligned}
& \text { atricts Jhalaud. } \\
& \text { Area }: 58744 \mathrm{ha.}
\end{aligned}
$$

$$
\begin{aligned}
& \text { Area } 558744 \text { ha. } \\
& \text { Unit } \\
& 0 \\
& 0
\end{aligned}
$$


Jehle No.IV2. 33
 DIstrict: Thunjhumu
Area : $12030 \mathrm{ha}, \stackrel{( }{9}$

| $\begin{aligned} & 8 . \\ & 3_{1} \\ & \hline \end{aligned}$ | Species Nome. |  |  |  | 40-50 | 50xabove. | Total | $x$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Acacia Sbecies | 128.892 | 8.592. | - | - | - | 137.484 | 16.16 |
| 2 | - Anogcistus pendula | 68.742 | - | - | - | - | 68.742 | 8.08 |
| 3 | Bosucllia perrata | 197.654 | 68.742 | - | - | - | 266.376 | 31.31 |
| 4 | Mise fopecies | 335.121 | 17.185 | 25.778 | - | - | 378.084 | 44.45 |
|  | Total | 730.389 | 94.519 | 25.778 | - | - | 850.686 | 100 |
|  | Stewict ha | 60.714 | 7.857 | 2.143 | - | - | 70.714 |  |
|  | $\%$ | 85.86 | 11.11 | 3.03 | $-$ | - | 100 |  |

Table_No. $\sqrt{V \prime} \cdot 2.34$

| $\frac{\text { Distribution of total stems by species and diameter classes and }}{\text { stens per hectare by dia classes in ancessible tree forest area }}$ |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | by | diacl | in |  | District: Pulı么 Vidsuipi <br> Area : qgettsici. <br> Unit t coostens |  |  |
| $\begin{aligned} & 5 . \\ & 140 . \end{aligned}$ |  | DIAMETER CLASSES (in cms) |  |  |  |  |  |  |
|  | Species Name | $\overline{10-20}$ | 20-30 - | 30-40 4 | 40-50 5 | 50\&above | Total | \% |
| 1 | Acacia centachin | 220.362 | 8.686 | 9.203 | - | -- | $238.251^{\circ}$ | 1.91 |
| 2 | Acacia Sbexis | 792.419 | 5.5.219 |  | 18.906 | . | 866.044 | 6.95 |
| 3 | Amagens ${ }^{\text {as }}$ latifeler | 209.091 | 92.033 | 8.20 .3 | a- | - | 310.327 | 2.49 |
| 4 | Anaguissu pe.ndula | 3149.506 | 101.236 | 18.406 | -- | - | 32.69 .116 | 26.22 |
| 5 | Boscullu. Serzata | 1688.677 | 808.659 | 424.355 | 134.438 | 18.406 | 30.79 .52 .8 | 24.69 |
| 6 | Sbysers acha | 99.685 | - | - | - | - | 99.685 | 0.80 |
| ¢ | Lummes Cesc mond did | 5: 402.362 | 328.218 | 128.329 | 64.423 | 3.9 .203 | $932 \cdot 535$ | 7.48 |
| 8 | issightentioctersa | y 76.089 | 119.643 | 27.610 | - | - | 423.352 | $3 \cdot 39$ |
| 4 | Mise ispecics | 2527.098 | 539.895 | 147.253 | 39.203 | 27.648 | 3251.097 | 26.07 |
|  | Total | 18365.299 | 2053.589 | 767.359 | 226.463 | 355.2 .57 | 12469.967 | 100 |
|  | Stems/ha | 101.714 | 29.303 | 8.356 | . 3.460 | 0.600 | 135.433 |  |
|  | \% | ${ }^{7} 75.10$ | 16.17 | 6.17 | 1.82 | 0.44 | 100 |  |

-25-
Tabla Mo. IV . 2.35

|  | $\frac{\text { DA strib }}{\text { aterana }}$ | tion of tota r hectare by | dia ciasse | spectien an | $\frac{\text { a diamet }}{\text { sible tr }}$ | $\begin{aligned} & \text { ter el sossos } \\ & \text { ree forest ar } \end{aligned}$ | $\frac{\text { and }}{\text { reas. }}$ |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | . |  |  |  |  | $\begin{aligned} & \text { strict: Sika } \\ & \text { Area : } 303 \\ & \text { Undt : } 000 \end{aligned}$ | 21 tha. $\begin{aligned} & 1 \\ & \mathfrak{G} \\ & \mathfrak{G} \\ & 1 \end{aligned}$ stemix. |
| 9. |  | DIAMETE | R CLASSES 4 | In cms) |  |  |  |  |
| 29. | Spectes Name. | 10-20 | 20.30 | $30-40$ | 40-50 | 50kabove | Motsl | \% |
| 1. | Acacia speciex | 216.576 | - | - | - | - | 216.576 | 7.50 |
| 2: | Amogeisusux pundules | 686.120 | 60.641 | 17.326 | - | - | 764.087 | 26.45 |
| 3 | Bofwallic surrata. | 947.767 | 197.524 | 10.396 | - | - . . | 1155.687 | 40.01 |
| 4. | Dioppyros malonixytin | 31.188 | - | - | $\therefore-$ | - | 31.188 | 1.06\% |
| 5. | Lammen coremandelica | 79.700 | 17.326 | 8.663 | - |  | 105.689 | 366 |
| 6. | Mixc. sprciex | 466.075 | 97.027 | 34.652 | 17.326 | - | 615.080 | 21.30 |
|  | - Totai | 2427.426 | 372.518 | 71.037 | 17.326 | - | 2888.307 | 100 |
|  | Stems/ta. | 80.058 | 12.286 | 2.343 | 0.57 | - | 95.258 |  |
|  | \% | 84.04 | 12.90 | 2.46 | 0.60 | - | 100 |  |

TablemaTV. 2.36
Digtribution of total wtems by mecteg and diencter elansog and

|  |  |  |  |  |  | District: Sirohi <br> Area : 111866 ha <br> Unit : 000 Stems |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | DIAMEL | ER CLA.BEST | in cms |  |  |  |  |
| $\$ 0$ | Soncter Name | $10-20$ | $120-30$ | $30-40$ | 40-50 | 50E obove | Total | \% |
| 1 | Acacia catechu | 29.050 | 10.315 | - | - | - | 39.365 | 0.29 |
| 12 | Acacia specres | 252402 | 19.367 | 9.683 | - | - | 281.452 | 2.04 |
| 3 | Anegrissus latifolia | 781.629 | 106.519 | 9.683 | - | - | 897.831 | 6.52 |
| 4 | Anogeissus pendula | 1050.875 | 67.784 | - | - | - | 1118.659 | 8.12 |
| 5 | Bosurelia ferrata | 439.967 | 346.501 | 329.660 | 109.676 | 10.315 | 1236.119 | 8.98 |
| 6 | Oiospyros malanoxy lou | 407.340 | 9.683 | 9.683 | - | - | 436.706 | $3 \cdot 10$ |
| $\ldots$ | Launca Coromandelica | 1070.873 | 457.021 | 126.517 | 29.050 | - | 1683.461 | 12.23 |
| .8 | Wrightiatiueteria | 932.146 | $136 \cdot 201$ | - | - | - | 1068.347 | 7.76 |
| 9 | Mise bpecies | . 5108.280 | 1249.178 | 387.342 | 164.620 | 106.562 | $7015 \cdot 982$ | 50.96 |
| ! | Totar | 10072.562 | 2402.569 | 872.568 | 383.346 | 116.877 | 13767.922 | 100 |
|  | Stesil / ha | 90.041 | 21.477 | 7.800 | 2.712 | 1.045 | 123.875 |  |
|  | \% | 73.16 | 17.45 | 6.34 | 2.20 | 0.85 | 100 |  |

Table No.TV.2.37 Distribution of total volume by species and diameter classes in accessible tree forest area.



Contents

ssible tree forest area.
Forest typer Khiuir Area $: 100942 \mathrm{ha}$. Unit $: 000 \operatorname{stanin} x$. 1 +

| $\begin{aligned} & \text { S. } \\ & \mathrm{NO} \\ & \hline \end{aligned}$ | Soectes Name | DIAMETER CLASSSES (in cms) |  |  |  | $50 \&$ above | fotal | $\%$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 10-20 | 20-30 | $30-40$ | - | 90 \& above |  |  |
| 11. | Acacia cataclur | 4679.521 | 224.464 | 26.442 | - | - | $4930.447^{\circ}$ | 70.4 |
| 12. | Acacia species | 111.096 | 8.882 | - | $\bigcirc$ | - | 119.978 | 1.7 |
| 3 | Anoguissins letifolia | 159.588 | 35.288 | 17.830 | - | - | 212.706 | 3.0 |
| 4.4 | Angoguisaus pindula | 127.437 | 26.354 | 9.453 | - | - | 165.249 | 2.3 |
| 1.5 | Boswallir sirrata | 36.671 | 35.530 | 44.413 | 8.882 | - | 125.496 | 1.8 |
| 6 | Diorpyros milunoxylin | 167.366 | 63.384 | - | - | - | 230.750 | 33 |
| 7. | Lammea coromendinica | 119.523 | 18.906 | - | - | $\checkmark$ | 138.429 | 2.0 |
| 8. | Tactoma grandiz | . 18.906 | - | - | - | - | 18.906 | 0.3 |
| $9$ | Wrightia timetoria | 35.530 | - | - | - | - | $35: 530$ | 0.5 |
| 10. | Mixc. spuciax | 901.512 | 81.449 | 35.110 | $8 \cdot 882$ | - | 1026.953 | 14.7 |
| . 1 | Total | 6357.150 | 496.282 | 133.248 | 17.764 | - | 7004.444 | 100 |

Diatribution of total atemn by soccies nnd ilameter classen in accessible tree forest arear

|  |  |  | distri | ts combl | 1) |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  | $\qquad$ | $\begin{aligned} & \text { Saln } \\ & 97842 \text { Wo } \\ & \text { coostiob } \end{aligned}$ |
| S. |  | DIMMETTE | ER CIMATSES | (1n cons) |  |  |  |  |
| $\mathrm{NO}_{0}$ | Specter Name | 10-20 | $20=30$ | 30.40 | 40-50 | 50 \& above | 20tal | $\%$ |
| 1 | Acacucateins | 896.274 | 54.529 | -- | - | - | 9950.80 .3 | 3.9 |
| 2 | Acaci bloctus | 452.370 | 8.53) | - | - | - | 461.250 | 1.9 |
| 3 | Anogrusus Antifolis | 392.50 .5 | 95155 | 8.374 | - | - | 496.637 | 2.0 |
| 4 | Anogeibsus pendula | 1384.297 | $53.0 \pm 1$ | - | - | - | 1437.248 | 5.9 |
| 5 | Bubciclin serrata | 12430.844 | 3980 | 1176.06 | 28.214 | 62.560 | $17: 231.979$ | 70.7 |
| 6 | Dicspysos welancx y | $\cdots 571.911$ | 1733 | - | - | - | $589 \cdot 228$ | 2.4 |
| 7 | LLimuea cirso mend dico. | 322.240 | $146 \cdot 363$ | $71.7 \% 4$ | 17.311 | 17.077 | 574.715 | 2.4 |
| 8 | Tectrue yruades | 60700 | $\cdots$ | - | - | - | 60.9700 | 0.3 |
|  | wr"jlina timetoxin | 395034 | 19.177 | - | - | - | $414.23 i$ | 1.7 |
|  | MISC Speces | $1840 \cdot 9175$ | 240.419 | $18 \cdot 692$ | - | - | $2150.6{ }^{2}$ | $8 \cdot 8$ |
|  | ToLal | 18.497 .310 | $3+15 \cdots 24$ | 1274.846 | -2096.423 | 74637 | 24366.463 | 100 |



accesulbla treg forant arens i
rorest type AlC combincat is

| $\begin{aligned} & S_{0} \\ & 8 \end{aligned}$ | Specter Name | DIAMETER CImS ES (In cmal |  |  |  | 52 fabove | Totst | * |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 10-20 | 20-30 | $30=80$ | $40=50$ |  |  |  |
| 1 | - Acecia catuchu | 219.038 | 74.674 | 23.969 | - | 10.631 | 33.3 .312 | 2.2 |
| 2 | Acauia Supemils | 116.970 | 55365 | 15.640 | 32545 | 20.599 | 241.114 | 1.6 |
| 3 | Anoguissus katifotia | 363.810 | 236.390 | 72.388 | 20.453 | 11.389 | 704.430 | 4.6 |
| 4 | Anogciosus pendula | 1334.214 | 482.894 | 142.580 | 55.631 | 63.414 | 2078.733 | $13 \cdot 7$ |
| 5 | Besurellia Aervata | 877.874 | 1245.841 | 1055.104 | 50.3 .577 | 137.636 | 3820.0 .32 | 25.1 |
| 6 | Diospyros mekumoxy lan | 208.740 | 188.154 | 107.585 | 23.033 | 20.135 | 547.647 | $3 \cdot 6$ |
| 7 8 | Launia conomandelica <br> Tectana greatis | $\begin{gathered} 315.473 \\ 375.849 \end{gathered}$ | $\begin{aligned} & 543.347 \\ & 114.841 \end{aligned}$ | $\begin{aligned} & 444.609 \\ & 28.160 \end{aligned}$ | $219.449$ | $159.499$ | $\begin{aligned} & 1682.377 \\ & 518 \cdot 850 \end{aligned}$ | $\frac{11 \cdot 1}{3 \cdot 4}$ |
| 9 | Wrightia timetora | $70 \cdot 880$ | 33.019 | 7.358 | $\bigcirc \cdot$ | - | 111.132 | 0.7 |
| 10 | Mise Sjecies |  |  |  |  |  | 5154.132 | 34.0 |
|  | Total , , | 5307.446 | 4156.192 | 2767.352 | 1403.878 | 1562.021 | 15196.8889 | 100 |





Contents



Table tro. 3 Y. 2.53

|  | Distribution of ste | $19 / h_{a_{1}} b$ | gpecifs | $\frac{\text { nd di }}{\text { rrict comb }}$ | $\begin{aligned} & \text { ter class } \\ & \text { ined) } \end{aligned}$ | es in acce | sible tree fo <br> Forest types <br> Area : <br> Und t | rest area. <br> Salcu <br> 97842 ha . <br> Stems/La | $\begin{gathered} 1 \\ \vdots \\ \vdots \\ \hline \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $S_{0}$ |  | $\frac{\text { DLint }}{10-20}$ | $\frac{16 K}{20-30}$ | $\frac{3 n}{30-40}$ | $\frac{140-50}{}$ |  |  |  |  |
| $\mathrm{NO} .$ | Species Name | $10-20$ | $20-30$ | $30-40$ | $140-50$ | 50 \& above | Total | \% |  |
| $i$ | Acaciaratechu | 0.224 | 0.062 | - | . - | - | 0.286 | $1 \cdot 0$ |  |
| 2: | Acoeia species | 0.078 | 0.010 | - | -- | - | 0 ORS | 0.3 |  |
| 3 | Anogeissub batipolia | 0.317 | 0.225 | 0.035 | - | - | 0.577 | - 1.9 |  |
|  | : Anogeissus Pendula | 0.425 | 0.092 | -- | -- | -- | 0.517 | 1.7 |  |
|  | Boswellia serrata | 7.094 | $7 \cdot 923$ | $6 \cdot 237$ | 2.752 | 1.816 | 2.5022 | 83.3 |  |
| 6.6 | Diospyoses Melonoxy/ch | 0.197 | 0.029 | - | - | -- | 0.226 | 0.8 |  |
|  | Lannea Coromandelica | 0.147 | 0.328 | 0.378 | c. 155 | c. 691 | 1.699 | 57 |  |
|  | Tectona Grandis | 0.044 | $\sim$ | - | - | -- | 0.044 | 0.1 |  |
| 9. | Wrightia tinctoria | 0.126 | 0.019 | - | - | -- | 0.145 | 0.5 |  |
| 10 | misc species | $0.9,34$ | 0.399 | 0.083 | -- | - | 1.416 | 4.7 |  |
|  | Total | 9.586 | 9.087 | 6.733 | 2.907 | 1.707 | 30.020 | 102 |  |



Contents


## AFPENDIX I

Year of Survey and publication of survey of India tope meps used for forest inventory in Rejesthan survey area.



| 74. | $45 \mathrm{C} / 8$ | .1959-60 | 1961 |
| :---: | :---: | :---: | :---: |
| 75. | $45 \mathrm{c} / 9$ | 1959-60 | 1961 |
| 76. | $45 \mathrm{c} / 10$ | 1959-60 | 1902 |
| 77. | $45 \mathrm{c} / 11$ | 1959-60 | 1961 |
| 78. | $45 \mathrm{c} / 12$ | 1959-60 | 1961 |
| 79. | $45 \mathrm{c} / 13$ | 1959-60 | 1961 |
| 80. | $45 \mathrm{C} / 14$ | 1959-60 | 1961 |
| 31. | $45 \mathrm{C} / 15$ | 1959-60 | 1961 |
| 82. | $45 \mathrm{C} / 16$ | 1959-60 | 1961 |
| 83. | $45 \mathrm{D} / 1$ | 1959-60 | 1961 |
| 84. | $45 \mathrm{D} / 2$ | 1959-60 | 1961 |
| 85. | $45 \mathrm{D} / 5$ | 1959-60 | 1961 |
| 86. | 45D/6 | 1959-60 | -1961 |
| 87. | $45 \mathrm{D} / 7$ | 1958-60 | 1962 |
| 88. | $45 \mathrm{D} / 9$ | 1959-60 | 1962 |
| 89. | $45 \mathrm{D} / 10$ | 1959-60 | 1951 |
| 90. | $45 \mathrm{D} / 11$ | 1959-60 | 1962 |
| 91. | $45 \mathrm{D} / \mathrm{Q} 3$ | 1959-60 | 1961 |
| 92. | $45 \mathrm{D} / 14$ | 1959-60 | 1967 |
| 93. | $45 \mathrm{D} / 15$ | 1959-60 | 1968 |
| 94. | $45 \mathrm{~F} / 4$ | 1970-71 | 1972 |
| 95. | $45 \mathrm{~F} / 8$ | 1970-71 | 1971 |
| 96. | $45 \mathrm{~F} / 12$ | 1970-71 | 1972 |
| 97. | $45 \mathrm{~F} / 15$ | 1960-61 | 1962 |
| 95. | $45 \mathrm{~F} / 16$ | 1970-71 | 1972 |
| 99. | $45 \mathrm{G} / 1$ | 1970-71 | 1971 |
| 100. | $45 \mathrm{G} / 2$ | 1971-72 | 1972 |
| 101. | $45 \mathrm{G} / 3$ | 1971-72 | 1973 |
| 102. | $45 \mathrm{G} / 4$ | 1971-72 | 1973 |
| 103 | $45 \mathrm{G} / 5$ | 1970-71 | 1972 |
| 104. | $45 \mathrm{G} / 6$ | 1971-72 | 1973 |
| 105. | $45 \mathrm{G} / 7$ | 197'-72 | 1973 |
| 106. | $45 \mathrm{G} / 8$ | 1971-72 | 1973 |
| 107. | $45 \mathrm{G} / 9$ | 1970-71 | 1972 |
| 108. | $45 \mathrm{G} / 10$ | 1971-72 | 1975 |
| 109. | $45 \mathrm{G} / 11$ | 1971-72 | 1975 |
| 110. | $45 \mathrm{G} / 12$ | 1969-70 | 1971 |
| 111. | $45 \mathrm{G} / 13$ | 1970-71 | 1972 |
| 112. | 45 G/14 | 1971-72 | 1973 |


| 113. | $45 \mathrm{G} / 15$ | 1971-72 | 1973 |
| :---: | :---: | :---: | :---: |
| 114. | $45 \mathrm{H} / 1$ | 1957-68 | 1969 |
| 115. | $45 \mathrm{H} / 2$ | 1967-68 | 1969 |
| 116. | $45 \mathrm{H} / 3$ | 1967-69 | 1970 |
| 117. | $45 \mathrm{H} / 5$ | 1967-68 | 1969 |
| 118. | 45 I/9 | 1969-70 | 1971 |
| 119. | $45 \mathrm{I} / 10$ | 1969-70 | 1971 |
| 120. | $45 \mathrm{I} / 13$ | 1969-70 | 1971 |
| 121. | 45 I/14 | 1978-79 | 1983 |
| 122. | $45 \mathrm{I} / 15$ | 1969-70 | 1971 |
| 123. | $45 \mathrm{~J} / 3$ | 1969-70 | 1971 |
| 124. | $45 \mathrm{~J} / 4$ | 1969-70 | 1971 |
| 125. | $45 \mathrm{~J} / 6$ | 1968-65 | 1970 |
| 126. | $45 \mathrm{~J} / 7$ | 1969-70 | 1971 |
| 127. | $45 \mathrm{~J} / 8$ | 1969-70 | 1971 |
| 128. | $45 \mathrm{~J} / 9$ | 1969-70 | 1971 |
| 129. | $45 \mathrm{~J} / 10$ | 1969-70 | 1972 |
| 130. | $45 \mathrm{~J} / 11$ | 1969-70 | 1973 |
| 131. | $45 \mathrm{~J} / 12$ | 1969-70 | 1972 |
| 132. | $45 \mathrm{~J} / 13$ | 1969-70 | 1971 |
| 133. | $45 \mathrm{~J} / 14$ | 1969-70 | 1972 |
| 134. | $45 \mathrm{~J} / 15$ | 1969-70 | 1972 |
| 135. | $45 \mathrm{~J} / 16$ | 1969-70 | 1972 |
| 136. | $45 \mathrm{~K} / 1$ | 1969-70 | 1971 |
| 137. | $45 \mathrm{~K} / 2$ | 1969-70 | 1971 |
| 138. | $45 \mathrm{k} / 3$ | 1969-70 | 1971 |
| 139. | $45 \mathrm{~K} / 4$ | 1969-70 | 1971 |
| 140. | $45 \mathrm{k} / 5$ | 1970-71 | 1972 |
| 141. | $45 \mathrm{~K} / 6$ | 1969-70 | 1979 |
| 142. | $45 \mathrm{~K} / 7$ | 1969-70 | 1971 |
| 143. | $45 \mathrm{~K} / 8$ | 1969-70 | 1971 |
| 144. | $45 \mathrm{~K} / 9$ | 1969-70 | 1971 |
| 145. | $45 \mathrm{k} / 10$ | 1969-70 | 1971 |
| 146. | $45 \mathrm{k} / 11$ | 1970-71 | 1972 |
| 147. | $45 \mathrm{k} / 12$ | 1969-70 | 1971 |
| 148。 | $45 \mathrm{k} / 13$ | 1969-70 | 1971. |
| 149. | $45 \mathrm{~K} / 14$ | 1969-70 | 1972 |
| 150. | $45 \mathrm{~K} / 15$ | 1969-70 | 1972 |
| 151. | $45 \mathrm{k} / 16$ | 1969-70 | 1971 Contents |



| 191. | $45 \mathrm{~N} / 8$ | 1969-70 | 1971 |
| :---: | :---: | :---: | :---: |
| 192. | $45 \mathrm{~N} / 9$ | 1970-71 | 1973 |
| 193. | $45 \mathrm{~N} / 10$ | 1971-7\% | 1973 |
| 194. | $45 \mathrm{~N} / 11$ | 1971-72 | 1973 |
| 195. | $45 \mathrm{~N} / 12$ | 1971-72 | 1973 |
| 196. | $45 \mathrm{~N} / 13$ | 1970-71 | 1973 |
| 197. | $45 \mathrm{~N} / 14$ | 1971-72 | 1972 |
| 198. | $45 \mathrm{~N} / 15$ | 1971-72 | 1973 |
| 199. | $45 \mathrm{~N} / 16$ | 1971-72 | 1973 |
| 200. | $450 / 1$ | 1971-72 | 1973 |
| 201. | $450 / 2$ | 1974-72 | 1973 |
| 202. | $450 / 3$ | - 1968-69 | 1970 |
| 203. | $450 / 4$ | 1968-69 | 1970 |
| 204. | $450 / 5$ | 1971-7,2 | 1973 |
| 205. | $450 / 6$ | 1971-72 | 1973 |
| 206. | $450 / 7$ | 1969-70 | 1974 |
| 207. | $450 / 8$ | 1969-70 | 1971 |
| 208. | 45 0/9 | 1970-71 | 1972 |
| 209. | $450 / 10$ | 1970-72 | 1973 |
| 210. | $450 / 11$ | 1969-70 | 1971 |
| 211. | $450 / 12$ | 1960-70 | 1972 |
| 212. | $450 / 13$ | 1970-71 | 1971 |
| 213. | 45 c/14 | 1070-7- | 1973 |
| 214. | $450 / 15$ | 1964-65 | 1971 |
| 215. | $450 / 16$ | 1964-65 | 1967 |
| 216. | $45 \mathrm{P} / 1$ | 1057-68 | 1970 |
| 217. | $45 \mathrm{P} / 2$ | 1067-68 | 1970 |
| 218. | $45 \mathrm{~F} / 5$ | 1070-71 | 1971 |
| 24. | $45 \mathrm{P} / 6$ | 1967-68 | 1971 |
| 220. | $45 \mathrm{P} / 9$ | 1070-71 | 1973 |
| 221. | $45 \mathrm{~F} / 10$ | 1970-7! | 1973 |
| 222. | $45 \mathrm{~F} / 13$ | 1970-71 | 1973 |
| 223. | $45 \mathrm{P} / 14$ | 1970-71 | 1973 |
| 224. | $45 \mathrm{P} / 15$ | 1970-71 | 1973 |
| 225. | $45 \mathrm{P} / 16$ | 1970-71 | 1973 |
| 226. | $46 \mathrm{E} / 5$ | 1968-69 | 1971 |
| 227. | $46 \mathrm{E} / 6$ | 1968-69 | 1970 |
| 228. | $46 \mathrm{E} / 9$ | 1967-68 | 1969 |
| 229. | $46 \mathrm{E} / 10$ | 1967-58 | 1972 |



| 269. | $54 \mathrm{~A} / 15$ | 1068-69 | 1969 |
| :---: | :---: | :---: | :---: |
| 270. | 54 A/16 | 1968-69 | 1970 |
| 271 . | $54 \mathrm{~B} / 1$ | 1970-71 | 1972 |
| 272. | $54 \mathrm{~B} / 2$ | 1970-7? | 1972 |
| 273. | $54 \mathrm{~B} / 3$ | 1970-71 | 1972 |
| 274. | $54 \mathrm{~B} / 4$ | 1970-71 | 1972 |
| 275. | $54 \mathrm{~B} / 5$ | 1970-71 | 1972 |
| 276. ${ }^{\text {, }}$ | $54 \mathrm{~B} / 6$ | 1970-71 | 1972 |
| 277. | $54 \mathrm{~B} / 7$ | 1970-71 | 1972 |
| 278. | $54 \mathrm{~B} / 8$ | 1970-71 | 1972 |
| 279 . | $54 \mathrm{~B} / 9$ | 1969-70 | 1974 |
| 280. | $54 \mathrm{~B} / 10$ | 1969-70 | 1973 |
| 281. | $54 \mathrm{~B} / 11$ | 1969-70 | 1975 |
| 282. | $54 \mathrm{~B} / 12$ | 1969-70 | 1974 |
| 283. | $54 \mathrm{~B} / 13$ | 1069-70 | 1973 |
| 284. | $54 \mathrm{~B} / 14$ | 1969-70 | 1974 |
| 285. | $54 \mathrm{~B} / 15$ | 1969-70 | 1974 |
| 286. | $54 \mathrm{~B} / 16$ | 1969-70 | 1974 |
| 287. | $54 \mathrm{C} / 1$ | 1069-70 | 1972 |
| 288. | $54 \mathrm{c} / 2$ | 1970-71 | 1972 |
| 289. | $54 \mathrm{c} / 3$ | 1970-71 | 1971 |
| 290. | $54 \mathrm{C} / 4$ | 1970-71 | 1973 |
| 291. | $54 \mathrm{c} / \mathrm{S}$ | 1970-71 | 1972 |
| 292. | $54 \mathrm{c} / 6$ | 1970-71 | 1972 |
| 293. | $54 \mathrm{C} / 7$ | 1970-71 | 1972 |
| 294. | $54 \mathrm{c} / 8$ | 1970-71 | 1972 |
| 295. | $54 \mathrm{c} / \mathrm{O}$ | 1069-70 | 1971 |
| 296. | $54 \mathrm{C} / 10$ | 1969-70 | 1970 |
| 297. | $54 \mathrm{c} / 11$ | 1968-69 | 1972 |
| 298. | $54 \mathrm{c} / 12$ | 1968-69 | 1973 |
| 299. | $54 \mathrm{c} / 13$ | 1969-70 | 1974 |
| 300. | $54 \mathrm{c} / 15$ | 1968-69 | 1973 |
| 301. | $54 \mathrm{c} / 16$ | 1968-69 | 1974 |
| 302. | $54 \mathrm{D} / 1$ | 1970-71 | 1973 |
| 303. | $54 \mathrm{D} / 2$ | 1970-71 | 1972 |
| 304. | $54 \mathrm{D} / 3$ | 1968-69 | 1976 |
| 305. | $54 \mathrm{D} / 4$ | 1968-69 | 1976 |
| 306. | $54 \mathrm{D} / 5$ | 1970-71 | 1972 |
| 307. | $54 \mathrm{D} / 6$ | 1970-71 | 1972 |
| 308. | $54 \mathrm{D} / \mathrm{C}$ | 1968-69 | 197. |


| 309. | $54 \mathrm{D} / 8$ | 1968－69 | 1976 |
| :---: | :---: | :---: | :---: |
| 310. | $54 \mathrm{D} / 9$ | 1971－72 | 1973 |
| 311. | $54 \mathrm{D} / 10$ | 1970－71 | 1972 |
| 312. | $54 \mathrm{D} / 11$ | 1968－69 | 1973 |
| 313. | $54 \mathrm{D} / 12$ | 1968－69 | 1977 |
| 314. | $54 \mathrm{D} / 13$ | 1971－72 | 1973 |
| 315. | $54 \mathrm{D} / 14$ | 1970－71 | 1972 |
| 316. | $54 \mathrm{D} / 15$ | 1968－6 | 1973 |
| 317. | $54 \mathrm{D} / 16$ | 1058－59 | 1274 |
| 318. | $54 \mathrm{E} / 1$ | 1968－69 | 1976 |
| 319. | $54 \mathrm{E} / 2$ | 1968－69 | 1975 |
| 320. | $54 \pm / 3$ | 1958－69 | 1969 |
| 321. | 54 E／4 | 1958－69 | 1969 |
| 322 。 | $54 E / 5$ | 1958－69 | 1969 |
| 323 。 | $54 \mathrm{E} / 5$ | 1968－69 | 1970 |
| 224 ． | $54 E / 7$ | 1968－69 | 1969 |
| $32 \%$ 。 | $54 \pm / 8$ | 1968－69 | 1955 |
| すくら。 | $54 E / 11$ | 1968－59 | 1905 |
| 327. | $54 \pm / 92$ | 1969－70 | 1970 |
| 32E． | $54 \mathrm{E} / 10$ | 1969－70 | 1972 |
| 329. | $54 \mathrm{~F} / \mathrm{T}$ | 1905－69 | 1075 |
| 330. | $54 \mathrm{~F} / 2$ | 1968－69 | 1973 |
| 351. | $54 \mathrm{~F} / 3$ | 1988－69 | 1972 |
| 332 。 | 54E／4 | 1969－70 | 1972 |
| 333 。 | $54 \mathrm{~F} / 5$ | 1968－69 | 1973 |
| 334. | $54 \mathrm{~F} / 5$ | 1968－69 | 1972 |
| 335. | $54 E / 7$ | 1968－69 | 1975 |
| 336. | $54 \mathrm{~F} / 8$ | INA | Ne． |
| 337. | $54 \mathrm{E} / 9$ | 1968－69 | 1970 |
| 338. | $54 E / 10$ | 1968－65 | 1977 |
| 339. | $54 \mathrm{E} / 11$ | 1968－65 | 1970 |
| 340. | $54 \mathrm{~F} / 13$ | 1968－59 | 1973 |
| 543 。 | $54 E / 14$ | 1965－65 | 197\％ |
| 342 。 | $54 \mathrm{G} / 3$ | 1969－76 | 1970 |
| 343. | 54 6／4 | 1958－69 | 1973 |
| 544. | $54 \mathrm{G} / 7$ | 1969－70 | 1971 |
| 345. | $546 / 8$ | 1969－70 | 197 |
| 346. | $54 \mathrm{H} / 2$ | 1967－63 | 1971 |
| 347. | $54 \mathrm{H} / 3$ | 1967－63 | 1972 |
| 348. | $54 \mathrm{~J} / 1$ | 1972－73 | 1974 |




[^0]:    Source: Jasic Statistics of Rejastann 1984.

[^1]:    by cifa clegreg in accessible tree Forest Arca.

