सत्यमेव जयते

For Official use only

Forest Resources Survey
in
Hill Region of Uttar Pradesh
(Almora, Nainital, Pithoragarh and part of Chamoli, Dehradun, Garhwal and Tehri Districts)

INVENTORY RESULTS

FOREST SURVEY OF INDIA
NORTHERN ZONE
SHIMLA
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P R E F A C E

Forest Survey of India has been carrying out survey of forest resources in the country with a view to monitor periodically (on a ten year cycle) the changing situation of land and forest resources. The survey focuses attention on critical aspects and gives the current status of forest land and resources.

This report presents inventory results of 'Hill region of Uttar Pradesh' comprising of Almora, Nainital, Pithoragarh and part of Chamoli, Dehradun, Garhwal and Tehri districts. Field inventory in the region was carried out during the period 1981-83.

The total geographical area covered under this survey is 28366 km^2 of which 42.24 percent (11969.60 km^2) area was forest in 1964-65, (reference year based on year of survey on SOI topo sheets). This is far less than 60 percent of the geographical area as laid down by the National Forest Policy to be optimum for maintaining ecological Stability in a hilly region. The survey has revealed that during the last 18 years (1964-82) 757.46 km^2 (6.3. percent) area was deforested/diverted for non-forestry purposes like agriculture and habitation, while an area of 298.93 km^2 (2.5 percent) got degraded into scrub, barren land and grass land due to biotic pressures. The forest cover has shrunk at the annual rate of roughtly 0.5 percent.

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Of 10913.21 km^2 which is tree covered, an area of 9857.32 km^2 is accessible and 1002.10 km^2 in inaccessible and 53.79 km^2 area is covered by water bodies. In the accessible tree covered area, 2316.07 km^2 (23.91 percent) area has canopy density of 70 percent and above, 5915.94 km^2 (61.07 percent), canopy density 30 percent to 69 percent, 1454.98 km^2 (15.02 percent) canopy density of less than 30 percent, while an area of 170.33 km^2 is plantations. Average canopy density in the region is 49.7 percent.

An alaming fact revealed by the inventory is that natural regeneration over 86.58% of accessible tree forest area is either absent or inadequate. The absence of national regneration appears to be correlated with grazing and fire incidence.

The region has variety of vegetation types. Fir, Deodar, Chirpi Mixed conifers, Hardwood mixed with conifers, Hardwood mixed with conifers, Upland hardwood, Teak, Sal, Khair and mixed forests. Per Unit are Fir forests have maximum growing stock of 176.366 m^2 per hectare volume, and Khair forests have the minimum 36.100 m^2/ha. Upland hardwood forests have maximum stems/ha (371) and Chirpine forests minimum (171). Average volume per hectare is 106.682 m^2, and average number of stems per hectare is 272. The accessible forests have a total growing stock of 104.9 million m^2 (267.8 million stems). Bamboo occurs as an understorey extending over 462.56 km^2 and the total number of useable culms are estimated at 62.312 million.

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The report compiled by Shri R.K.Sood, Deputy Director with the assistance of Shri M.S.Mehta, Sr. Technical Assistant, and under the guidance of Shri S.C.Joshi, Joint Director, Forest Survey of India, Northern Zone, Shimla is a commendable effort. It is hoped that the report will be useful to the State Forest Department and the other organisations in planning development of forest resources in the region.

Sd/- J.B.Lal
Director
Forest Survey of India
Dehradun.

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SUMMARY

1. The forest inventory survey has been carried out in the Hill Region of U.P. during 1981 to 1983. Some catchments in Hill region, previously surveyed under Pre investment Survey of Forest Resources have been left out of the current survey.

2. The objectives of the survey are to assess the forest resources, changes therein, so as to focus attention on the critical aspects, thereby helping in development planning.

3. Total geographical area covered is 28336 km^2 of which 42.24 percent (11969.60 km^2) area was 'forest area' in 1964-65. (Reference year, based on year of survey on SOI topo sheets). National Forest policy lays down that in hilly tracts, 60 percent of the total area should be under forests. It is observed that forest area in Hill region of U.P. needs to be increased.

4. During the period of 18 years (1964-82) changes have occured in the total forest area of 11969.60 km^2 and the present status is:-

Status	Area (km^2)	Percentage
a) Inaccessible area	1002.10	8.4
b) Diverted for non forestry purposes	757.46	6.3
c) Degraded to barren, scrub and grass land	298.93	2.5
d) Water bodies	53.79	0.4
e) Accessible tree forest area	9857.32	82.4
Total forest area	11969.60	100.0

The contribution to the total forest inventory is only from the 'accessible tree forest area'

5. The average canopy density over tree forest area is 49.7 percent.

6. Soil depth in the forest area is adequate and only about 10 percent area suffers from moderate erosion.

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7. 1333.42 km^2 of area is potentially plantable (new and supplementary planting).

8. Natural regeneration over 6.46 percent (636.51 km^2) out of 9857.32 km^2 of tree forest area is adequate.

9. Bamboo occurs in Garhwal district over an over lapping forest area of 462.56 km^2 . The number of bamboos in the region are 62.3 million.

10. 10 forest types occur in the region.

The per hectare volume and stems in various forest types of accessible tree forest area has been estimated as follows:

Forest type	Total area ha.	Vol./ha m^3	Stems/ha
1. Fir	5673	176.366	224.325
2. Deodar	677	137.166	180.000
3. Chir pine	239047	79.425	171.412
4. Mixed conifers	677	-	-
5. Hardwood mixed with conifers	53063	92.636	281.837
6. Upland hardwood	231631	112.486	370.619
7. Teak	10561	69.278	246.156
8. Sal	142173	175.303	331.608
9. Khair	14302	36.100	229.450
10. Miscellaneous	285593	96.847	250.892
11. Unrecorded	2335	-	-
Total	985732	106.682	272.370

11. The district wise break up of the accessible tree forest area, alongwith the stand and stock figures is:

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Sl. No.	District	Area ha.	Vol./ha	Stems/ha
1.	Almora	220782	95.128	256.889
2.	Chamoli	98480	93.430	348.293
3.	Dehradun	75403	133.938	318.384
4.	Garhwal	158602	124.610	280.092
5.	Nainital	250051	107.521	263.301
6.	Pithoragarh	157134	102.339	230.163
7.	Tehri	22945	81.660	278.867
8.	Unrecorded	2335	-	-
	Total	985732	106.682	272.370

12. Total growing stock in the hill region surveyed is 104.9 million m^3 and 267.8 million stems.

13. The rural household fuel consumption in Nainital is 498.9 kg. per capita per annum. Out of this 69.7 Kg. is agricultural waste and 429.2 Kg. is from trees growing in Govt. forests/lands. In addition, 8.3 litres per capita per annum of kerosene oil is used.

In Pithoragarh district the rural household fuel consumption is 965.4 Kg. per capita per annum. No agricultural waste is used. The kerosene oil consumption is 7.6 litres per capita per annum.

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CHAPTER-1

THE BACKGROUND

1.1 Introduction

The Forest Survey of India has 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 critical aspects of forest resources in the country. The Expenditure Finance Committee Memo (No.6-33/79-F.II) stresses 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 10 year cycle) the changing situation of land and forest resources and to focus attention of National planners on critical aspects of forestry.

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 useable form for the National/State level planning.

The U.P. Forest Department in their 'Forest Statistics' have recognised four geographical regions in the State viz. The Hill, Terai, Indo Gangetic plain and Vindhyan regions. The hill region of U.P. consists of eight districts viz. Almora, Chamoli, Dehradun, Garhwal, Nainital, Pithoragarh, Tehri and Uttar Kashi. However some 'catchments' in the hill region have been surveyed earlier by the 'Pre investment Survey of Forest Resources'. The areas surveyed earlier have not been included in the current survey. The map showing the 'hill region' and the survey region is given at page 2 . The field work was undertaken during 1981-83.

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1.2 Location

The survey area is situated between 28°-40' and 30°-50' North latitudes and 77°-35' and 81°-5' East longitudes (see location map at page 4)

1.3 Climate

The climate in Hill region of U.P. varies from sub-tropical in the lower parts to temperate in the higher reaches. Annual rainfall varies from 1000 mm to 2500 mm. There is a wide variation in minimum & maximum temperature. In winter the temperature drops down below 0° celsius. The summer temperature goes upto 40° celsius.

1.4 Physical features

As the name of the region implies, the terrain is 'hilly'. The majority of the forests lie between 300 meters to 3000 meters.

1.5 Socio-econimic conditions of the people

The region can be categorized as economically 'backward'. The net-work of roads and communication is poor. About 65% of the geographical area is 'forest area' as per the 'land use classification'. Mostly subsistance agriculture is practised in the region. The human population and cattle population density is given in table No.1.5.2

1.6 Forests

Classification of forests into types has been done on the basis of occurrence of species. The following forest types were found in the survey area.

1. Fir - Wher Fir constitute more than 50%
2. Deodar - Where Deodar constitute more than 50%
3. Chir-pine - Where Chir-pine constitute more than 50%
4. Mixed conifers - Where all conifers taken together constitute more than 50%
5. Hardwoods mixed with conifers - Where the conifers & broad leaved species occur in more or less in same proportions.
6. Up-land hardwoods - Broad leaved species constitute more than 50% in the Upper Chir zone above 1500 metre altitude.
7. Teak - Where Teak constitute more than 20%
8. Sal - Where Sal constiture more than 20% (if sal & Teak are both more than 20% preference to be given to Teak)
9. Khair forest - Where Khair tree constiture more than 50%
10. Miscellaneous forest- Forest which could not be classified in any of the above classes

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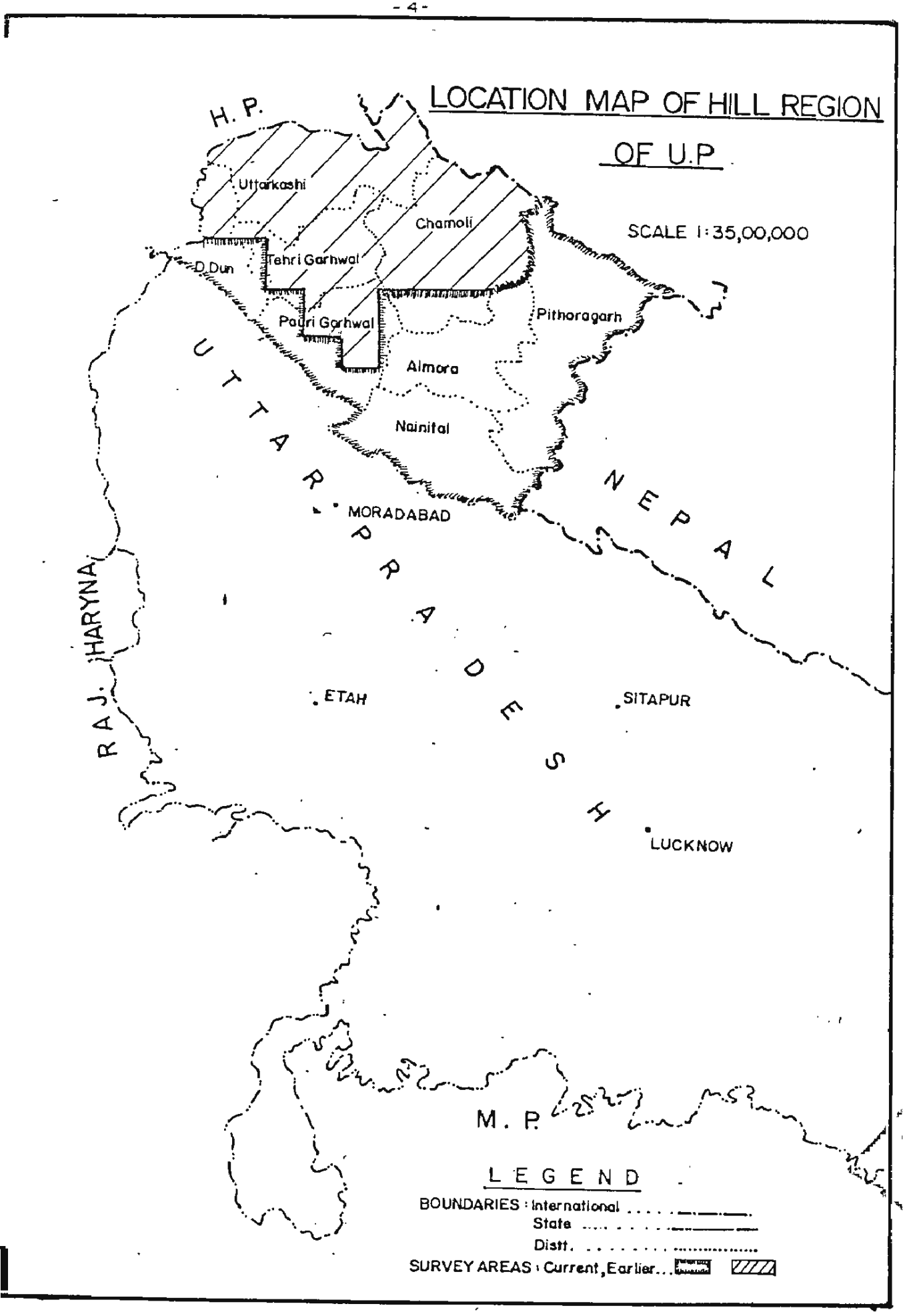
LOCATION MAP OF HILL REGION OF U.P
SCALE 1:35,00,000
H. P.
Uttarkashi
Chamoli
Tehri Garhwal
D.Dun
Pauri Garhwal
Pithoragarh
Almora
Nainital
UTTAR PRADESH
NEPAL
MORADABAD
HARYANA
RAJ.
ETAH
SITAPUR
LUCKNOW
M. P.
LEGEND
BOUNDARIES : International
State
Distt.
SURVEY AREAS : Current, Earlier...

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Table No. T.5.1

District-wise area under forests and agriculture

Area Unit: km^2

Sl. No.	District	Geographical area	Agricultural area	% of geographical area	Geographical area surveyed	Forest area (calculated by dot grid)	% of geographical area surveyed
1.	Nainital	6794	3310.80	48.7	6634	2933.29	44.2
2.	Pithoragarh	8856	1257.65	14.2	8856	2119.97	23.9
3.	Almora	5385	1734.05	32.2	5385	2674.12	49.7
4.	Garhwal	5440	1702.99	31.3	3374	1907.01	56.5
5.	Chamoli	9125	634.12	6.9	1770	1191.15	67.3
6.	Dehradun	3088	864.89	28.0	1791	850.87	47.5
7.	Tehri	4421	1196.95	27.1	526	293.19	55.7
	Total	43109	10701.45	24.8	28336	11969.60	42.24

Source: Geographical area - India 1985.

Agricultural area - Forest Statistics U.P. 1981.

Table No. T.5.2

Human population and Livestock population/Density

Sl. No.	District	Geographical area (km^2)	Human population '000'	Density	Livestock population '000'	Density
1.	Nainital	6794	1137	167	492	72
2.	Pithoragarh	8856	498	56	625	71
3.	Almora	5385	757	141	725	135
4.	Garhwal	5440	638	117	672	124
5.	Chamoli	9125	364	40	494	54
6.	Dehradun	3088	762	247	349	113
7.	Tehri	4421	498	113	429	97
	Total	43109	4654	108	3786	88

Source: Geographical area - India 85
Human population - India 85
Livestock population Forest Statistics 1981.

CHAPTER-2

2.1 Design and Methodology of the Survey

The 'forest areas' marked on 1:50,000 scale topographic map sheets prepared by the Surveyof India were used as the basis of forest inventory. The year of survey and publication of the maps used in the survey area given in Appendix-I. To monitor the change in the forest cover thematic maps prepared by interpretation of latest aerial photographs were to be used. Such thematic maps were to form the basis for collection of growing stock data. However thematic maps were not available due to constraints beyond the control of the organisation.

2.2 Definition of forest area

The following are treated as 'Forest Areas' for carrying out the forest inventory and for the purpose of this report.

i) All those areas shown in 'green wash' on the Survey of India toposheets.

ii) All such areas in which words such as thick jungle, thick forest, dense jungle, open forest, bamboos etc are printed.

iii) All those areas indicated by dotted line or broken line or a pillar line as 'Forest Areas'.

2.3 Sampling design

1:50,000 scale Survey of India topographic sheet was divided into 36 grids of 2½'x2½' of latitudes and longitudes. In each of such grids two sample points were marked. The inventory data was collected at sample plots falling in 'forest area'.

2.3.1 Method of marking two point cluster in the grid

The length and width of each grid is measured to the first decimal in millimetres. From this length 0.6 mm is deducted. Suppose, the measurable length and width of a grid along its X & Y axis are 83.5 mm and 92.5 mm respectively. After deducting 0.6 mm, the reduced length and width are 82.9 mm and 91.9 mm respectively. A three digit random number is selected from the random number table for each axes separately.

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If the selected random numbers are less than 829 and 919 respectively then they are retained as such otherwise the next random number is considered. Suppose the random numbers selected are 144 and 161 respectively, then the numbers will correspond to 14.4 mm and 16.1 mm lengths along the X and Y axes respectively. To these lengths viz 14.4 mm and 16.1 mm, 0.3 mm is added. Now 14.7 mm and 16.4 mm become the co-ordinates of the first sample point in the grid. Taking SW corner of this grid as origin and measuring 14.7 mm and 16.4 mm along X & Y axis respectively the centre of the first plot is marked. The centre of the first plot is then joined by a straight line to the grid centre. This line is extended on the other side. On this extended line the second is marked at a distance equal to the distance of the first point from grid centre. This point is the centre of the second plot.

All sample points falling in forest areas are located on the ground. Quantitative data is collected from sample plots and qualitative data from the surroundings of the plot. The co-ordinates of the plot centres inventoried and the relevant data pertaining to these plots is given in Appendix-II.

2.4 Field methodology

The field data is collected by a crew, consisting of one Junior Technical Assistant (Crew leader), a Deputy Ranger and two to three Fieldmen. The crew leader is provided with a list of sample plots to be surveyed during the season alongwith a set of toposheets with sample points already marked. A set of measuring instruments viz Silva's compass, Haga/ Blume Leiss hypsometer, Callipers, measuring tapes and ranging rods etc. are provided.

After deciding the plot and the grid number to be surveyed on a particular day from a camping spot the crew leader reaches a prominent physical feature (also called starting reference point, as near to the sample point as possible) which is depicted on the map and can also be identified on the ground. Usually, the following features are selected as reference point:

i) Bench marks
ii) Triangulation points
iii) Village trijunction points
iv) Bridges and culverts
v) Temples, mosques and churches.

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vi) Crossing of rail tract with roads, rivers streams.

vii) Junctions of rivers of streams with roads

viii) Junction of streams

ix) Junction of roads

x) Prominent bends in roads, rivers, streams

xi) Ponds and wells

xii) Springs

xiii) Prominent topographical features in hilly region such as spurs, knolls etc.

xiv) Mile stones or kilometer stones.

xv) Boundary pillars (of international, state, district and forest boundaries).

Having located a prominent physical feature (reference point) both on the ground as well as on the map, the distance & bearing of the sample point from this physical feature is measured from the map. The bearing is measured with the help of a protractor or the Silva's compass. At this reference point the crew leader records details of the sample point from the reference feature, the name of the camping spot etc, in the 'Plot Approach Form'. Information recorded in this form is used in time and cost study for the inventory and helping to relocate the point at a future date. Specimen of this form is given in Appendix-III. From the reference point crew leader traverses the distance in the direction as measured on the map to reach the sample point. A wooden peg is fixed at this location which is the centre of the sample plot. After reaching the sample point, a square sample plot of 0.1 ha. area with diagonals measuring 44.72 metres in NE-SW & NW-SE directions is laid out on the ground by marking its four corners by pegs. Regeneration data is collected from a plot measuring 4 m x 4 m, and herb-shrub data from a plot of 2 m x 2 m size (see diagram at page 10).

After laying out the plot, the crew leader with the help of other crew members collects the inventory data in the following field forms:

i) Plot description form

ii) Plot enumeration form

iii) Sample tree form

iv) Bamboo enumeration form (clump forming)

v) Bamboo enumeration form (Non clump forming)

vi) Bamboo weight form

vii) Herbs and shrubs data form

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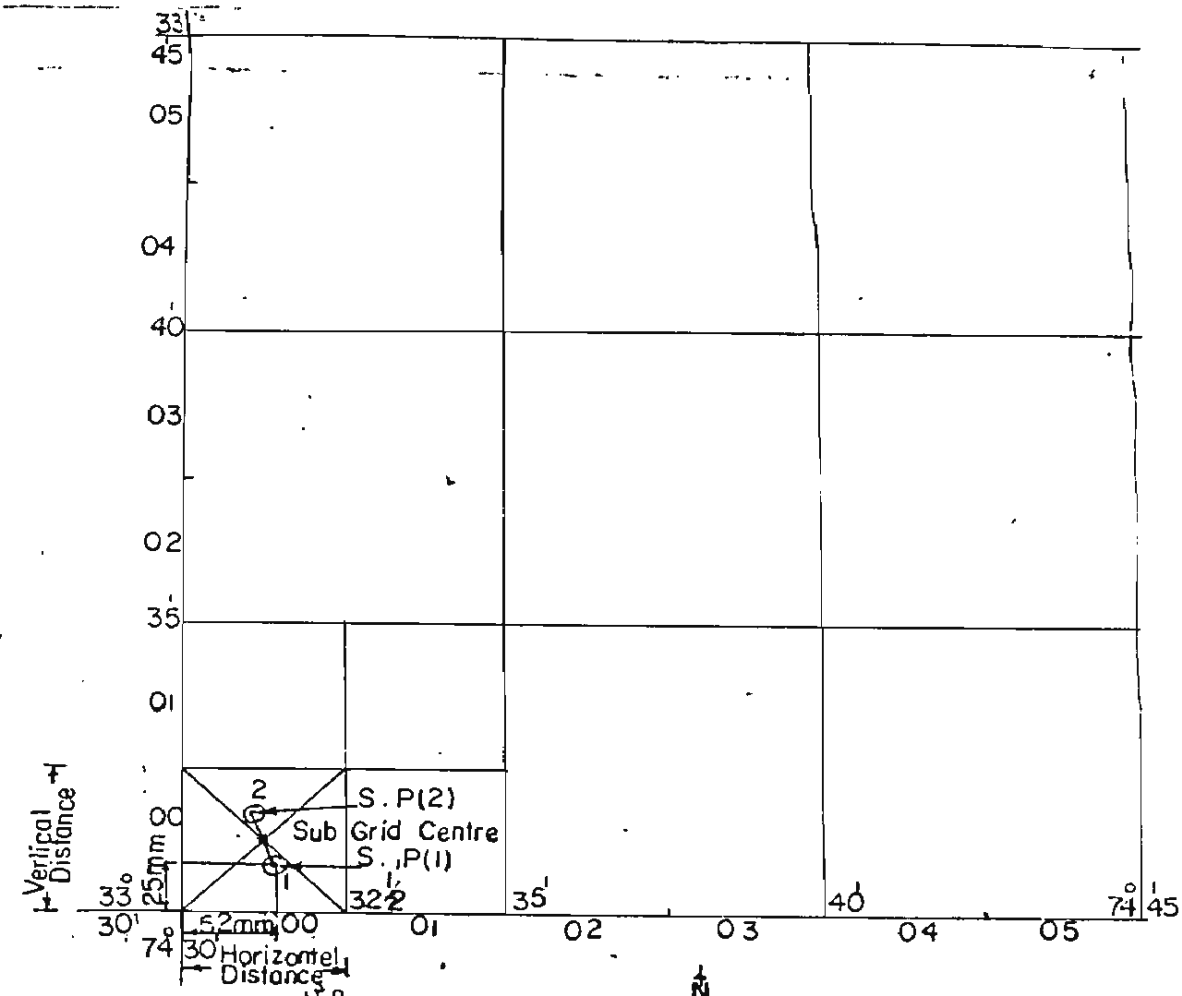
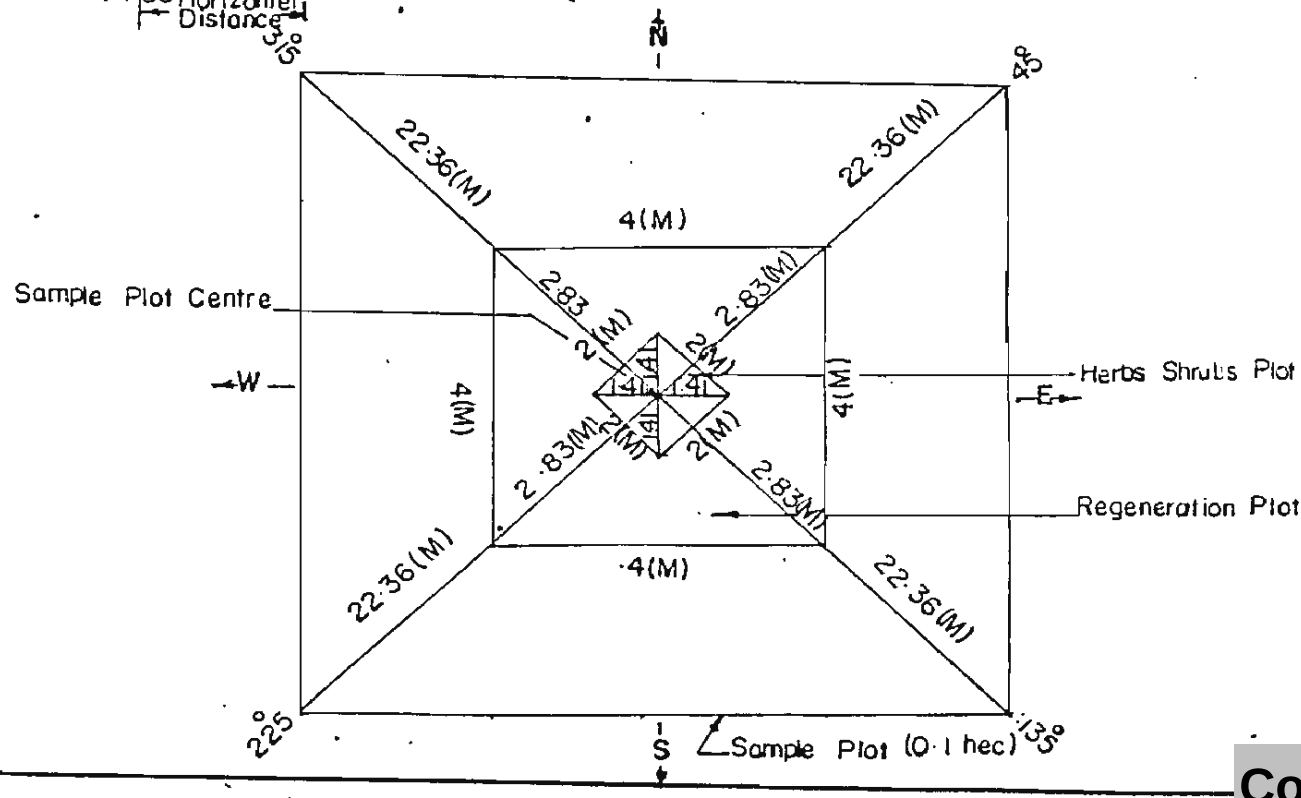
SKETCH SHOWING SAMPLING DESIGN AND LAYOUT OF PLOTS





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Facsimile of the above field forms may be found in Appendix-III. They are briefly described below:

(i) Plot description form (PDF)

Qualitative data such as land use, crop composition of tree crop and its density, intensity of erosion in the area, fire and grazing incidence, regeneration status etc. arerecorded in this form. The basis of assessment is occular, by examing a surrounding area of about 2 ha. around the plot centre.

(ii) Plot enumeration form (PEF)

In this form the trees and bamboo clumps in the sample plot are enumerated and recorded with their species and diameter at breast height.

(iii) Sample tree form (STF)

The data in this form is collected from the northern quadrant of the sample plot. Name of the tree species, its diameter at breast height, twice back thickness, dominance status, length of the clear bole, and height etc. of each tree enumerated in this quadrant are recorded. The data from this form helps in developing the local volume equations for the species in the survey area. Under bark volume is also derived from the local volume equations with the help of bark thickness data.

(iv) & (v) Bamboo enumeration (clump and non clump variety) Form

These forms are used wherever bamboo clumps, whether of clump or non-clump forming variety, are encountered in the sample plots. Data such as culms in each clump, their size, maturity condition, length etc. are recorded.

(vi) Bamboo weight form

For determing the co-relation between green and dry weight of the utilizable length of bamboo culm, data on weight are recorded in this form.

(vii) Herbs and shrubs data form

In this form names and other details of all identifiable species of herbs and shrubs are recorded. In case of species that could not be identified in the field, the number of such species only are noted.

The above is a brief description of the survey methodology. The details are given in 'the Manual of instruction for field inventory' of Forest Survey of India.

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CHAPTER-3

DATA PROCESSING

Processing on electronic computer

After the completion offield work, the field forms (i to vii) of the region surveyed are consolidated and sent to the data processing unit of this organisation at Dehradun. The data contained in the field forms are checked for inconsistencies and coding mistakes. The coded data is then transferred on to punch card using punching machines. Punching mistakes are detected with the help of card verifier, and the mistakes, if any, are rectified. The cards are then sorted and loaded onto the computer. A suitable programme is evolved to get the results in the desired format. The data pertaining to this region has been processed mainly on 332 system of ECIL of NFCC, FRI, Dehradun.

3.1 Area computation

The area of 'forest land' on the 1:50,000 scale, topographical maps was calculated using dot grid template. The district- wise forest area was separately computed in respect of green wash and demarcated blanks to obtain more reliable information about changes occuring in each category. Further distribution of forest area under 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 proportionately using ratio estimator. However it may be noted that area tables are based on very 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 discontinued. Therefore, the height diameter data of sample trees of current survey area were compared with height diameter data of other project areas completed by this organisation in the past for which general volume equation of species were available based on actual felled trees. The

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felled tree data found to match most closely were adopted for the present area. The volume equations adopted for different species occurring in the Hill Region of U.P. are:-

1. Acacia catechu (126)

$$V = 0.02384 - 0.72161\ D + 7.46888\ D^2$$

2. Anogeissus latifolia (64)

$$\sqrt{V} = 0.46976 + 5.99849\ D - 2.60729\sqrt{D}$$

3. Dalbergia sissoo (71)

$$\sqrt{V} = 0.31650 + 4.54751\ D - 1.46921\sqrt{D}$$

4. Eucalyptus species (220)

$$V = 0.02894 - 0.89284\ D + 8.72416\ D^2$$

5. Lannea coromandelica (102)

$$V = 0.19381 - 0.83928\sqrt{D} + 10.32053\ D^2$$

6. Ougeinia dalbergiodes (132)

$$\sqrt{V} = 0.41563 + 5.14405\ D - 2.11832\sqrt{D}$$

7. Pieris ovalifolia (256)

$$V = 0.03468 - 0.56878\ D - 4.72282\ D^2$$

8. Pinus roxburghii (874)

$$\sqrt{V} = 0.05131 + 3.98590\ D - 1.02450\sqrt{D}$$

9. Quercus incana (763)

$$V/D^2 = 4.15846 + 0.03484/D^2 - 0.46100/D + 3.04122\ D$$

OR

$$V = 0.03484 - 0.46100\ D + 4.15846\ D^2 + 3.04122\ D^3$$

10. Quercus dilatata (154)

$$\sqrt{V} = 0.47511 + 4.93282\ D - 2.45047\sqrt{D}$$

11. Quercus semicarpifolia (184)

$$V/D^2 = 8.57555 - 1.34258/D + 0.08875/D^2$$

OR

$$V = 0.08875 - 1.34258\ D + 8.57555\ D^2$$

12. Rhododendron arboreum (645)

$$V = 0.06007 - 0.21874\sqrt{D} + 3.63428\ D^2$$

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13. Shorea robusta (1042)

$$V = 0.03085 - 0.77794\ D + 8.42051\ D^2 + 5.01067\ D^3$$

14. Syzygium cumini (171)

$$V/D^2 = 13.36728 + 0.09809/D^2 - 1.94468/D - 6.33263\ D$$

OR

$$V = 0.09809 - 1.94468\ D + 13.36728\ D^2 - 6.33263\ D^3$$

15. Tectona grandis (48)

$$V = 0.08847 - 1.46936\ D + 11.98979\ D^2 + 1.97056\ D^3$$

16. Terminalia crenulata and rest of the species

$$V = 0.384590 - 3.45596\ D + 10.98759\ D^2$$

(a) Figures in the brackets indicate the number of trees on which the equations are based.

(b) In the equations:-

V = Underbark volume (m^3) upto 5 cm. top, overbark limit.

D = Breast height overbark diameter (m)

H = Total standing height (m)

3.3 Stand and stock tables:

The volume of each enumerated tree of a species was estimated by substituting its breast height overbark 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.

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3.4 Sampling error

The sample was considered to constitute a s mple 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 = Total No. of clusters (grids) in the sample

x_i = The No. of plots in the ith cluster (grid)

y_i = The total of per hectare volume in the ith cluster.

$$\bar{x} = \sum_{i=1}^{n} \frac{x_i}{n} = \text{Avg. No. of plots per cluster}$$

$$\hat{R} = \frac{\sum_{i=1}^{n} y_i}{\sum_{i=1}^{n} x_i} = \text{Estimate of average volume per hectare over all clusters.}$$

$$V(\hat{r}) = \frac{1}{n\,(n-1)\,\bar{x}^2}\left(\sum_{i=1}^{n} y_i^2 - 2\hat{R}\sum_{i=1}^{n} x_i\, y_i + \hat{R}^2 \sum_{i=1}^{n} x_i\right)$$

(Ignoring finite population correction factor)

Estimate of standard error of $\hat{R}$

$$S.E. = \sqrt{V(\hat{R})}$$

$$S.E.\ \% = \frac{S.E. \times 100}{\text{Mean}} = \frac{S.E. \times 100}{\hat{R}}$$

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

$$SE(\text{Vol. region}) = \sqrt{SE_1^2 . A_1^2 + SE_2^2 . A_2^2 + \ldots\ldots SE_n^2 . A_n^2}$$

Where $SE_1 \ldots\ldots n$ are SEs of districts 1 to n

and $A_1 \ldots\ldots n$ are areas of districts 1 to n

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

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CHAPTER 4

Forest Inventory Results

In this chapter, the results of forest inventory and the critical aspects of forestresources as evident therefrom in the survey area are presented. This is a very low intensity survey (0.01 percent). Its results are therefore, reliable and valid for the region as a whole. However, district-wise information of some attributes has also been given which may be considered as indicative only.

4.1 Forest area

'Forest area' has already been defined in Chapter 2. Forest inventory survey comprise of two components, namely information withregard to area under forest cover (forest area) which is computed from maps and estimation of growing-stock by ground sampling in such areas.

The survey area is covered by 48 topo-sheets viz. 53 F/11,15,16, J/3,4,8, K/1,5,9,10,14,15 N/4 8,12,16, O/1 to O/16, P/9,13, 62 B/4,8,12, C/1 to C/9, D/1 & 2 which were used as the basis for inventory. These topo-sheets were surveyed by Survey of India during the period 1920-21 to 1966-67 (See appendix-I). From the distribution pattern of the sheets surveyed over the years, 1964-65 has been taken as base year for monitoring the changes in the 'forest area' subsequently till 1981-83 (when field inventory was done). The following table gives the district-wise 'forest area' computed by dot grid method, and number of sample plots falling therein.

Table 4.1

Table showing 'forest area' number of sample plots and weighted average.

S.No.	District	Forest area km^2	No.of sample plots inventoried	Weighted average km^2
1.	Nainital	2933.29	366	8.01
2.	Pithoragarh	2119.97	313	6.77
3.	Almora	2674.12	281	9.52
4.	Garhwal	1907.01	202	9.44
5.	Chamoli	1191.15	127	9.38
6.	Dehradun	850.87	123	6.92
7.	Tehri	293.19	46	6.37
	Total	11969.60	1458	

Note: 'Forest area' falling in Corbett National Park in Nainital and Garhwal districts have been excluded.

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4.1.1 Distribution of forest area in land-use classes

Total 'forest area' surveyed is 11969.60 km^2. Out of this 8.4% (1002.10 km^2) is inaccessible and unsampled area. The land-use classification of the total area is given in table No. IV.1 .1.

On examination of this table following critical aspects about the forest resources in the region are evident.

(a) 42.24% (11969.60 km^2) of the geographical area surveyed (28336.00 km^2) in the hill region was under forest cover in the year 1964-65, taken as reference year. National Forest policy envisages 60% of the geographical area under forest cover in hill areas. Thus the forest area in the region is below the level laid down by the National Forest Policy. Hence, there is a need to bring more areas under tree cover in the region.

(b) During the 18 years period between 1964-65 to 1982, 6.3% (757.46 km^2) of the forest area (11969.60 km^2) has been diverted for other uses such as agriculture and habitations and non forestry plantations. 2.5%(298.93 km^2) of the forest area (11969.60 km^2) has been degraded to scrub, barren and grass land. The diversion of 6.3% of forest area for non forestry purposes in 18 years period is not alarming but needs to be checked and stopped all together.

(c) Area under accessible tree forest is 9857.32 km^2, i.e. 82.4% of the forest area surveyed (11969.60 km^2)

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Table No. IV.1.1

District-wise distribution of Forest area in land use classes

Area in km^2

S.No.	Land use	Almora Area km^2	Chamoli Area km^2	Dehradun Area km^2	Garhwal Area km^2	Nainital Area km^2	Pithoragarh Area km^2	Tehri Area km^2	Total Area km^2	%
1.	Dense tree forest	494.86	196.96	332.05	320.98	809.46	149.01	12.75	2316.07	19.4
2.	Moderately dense tree forest	1351.34	647.16	345.88	1019.58	1274.30	1131.09	146.59	5915.94	49.4
3.	Open tree forest	342.59	140.68	89.93	245.46	288.52	277.69	70.11	1454.98	12.2
4.	Plantation	28.55	-	-	-	128.23	13.55	-	170.33	1.4
5.	Scrub forest	9.52	-	13.83	18.88	24.04	33.87	25.50	125.64	1.1
6.	Grass land	19.03	37.52	6.92	9.44	8.01	13.55	-	94.47	0.8
7.	Barren land	9.52	9.38	6.92	9.44	8.01	6.77	12.75	62.79	0.5
8.	Cultivation	171.29	37.52	27.68	132.17	168.30	115.15	19.12	671.23	5.6
9.	Water bodies	-	-	-	37.76	16.03	-	-	53.79	0.4
10.	Habitation	9.52	-	13.83	-	24.05	-	-	47.40	0.4
11.	Other lands	-	-	-	-	16.03	-	-	16.03	0.1
12.	Non forestry plantations	-	-	-	-	32.06	6.77	-	38.83	0.3
13.	Inaccessible and un-recorded	237.90	121.93	13.83	113.30	136.25	372.52	6.37	1002.10	8.4
	Total:-	2674.12	1191.15	850.87	1907.01	2933.29	2119.97	293.19	11969.60	
(a)	Actual accessible forest area (1 to 7 & 11)	2255.41	1031.70	795.53	1623.78	2556.60	1625.53	267.70	10156.25	84.9
(b)	Accessible tree forest area (1 to 4)	2217.34	984.80	767.86	1586.02	2500.51	1571.34	229.45	9857.32	82.4
(c)	Forest area degraded to barren land, scrub, grass land and other lands (5 to 7 & 11)	38.07	46.90	27.67	37.76	56.09	54.19	38.25	298.93	2.5
(d)	Forest area diverted for other uses (8,10&12)	180.81	37.52	41.51	132.17	224.41	121.92	19.12	757.46	6.3

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4.1.2 Distribution of accessible forest area by soil depth classes and districts.

Total accessible forest area is 10,156.25 km^2 (Table IV.1.1).

39.20 percent of the area has soil depth of 90 cm or more. This soil depth class is ideal for forest growth. About 20 percent of the area has soil depth less than 30 cm. District-wise distribution of accessible forest area by soil depth classes is given in Table No. IV.1.2.

Table No.IV.1.2

Distribution of accessible forest area 'green wash' by soil depth and district.

Total area :10,156.25 km^2
Total sample plots : 1235
Area Unit : km^2

Districts	SOIL DEPTH CLASS						
	No soil	Soil depth less than 15 cms	Soil depth 15 cms or more, but less than 30 cms.	Soil depth 30 cms or more, but less than 90 cms.	Soil depth 90 cms. or more	Un-recorded	Total
Dehradun	-	6.92	-	193.69	581.08	13.84	795.53
Almora	-	95.17	342.60	1065.84	732.77	19.03	2255.41
Pithoragarh	6.77	54.19	501.21	812.76	243.83	6.77	1625.53
Nainital	-	80.14	216.39	729.31	1522.75	8.01	2556.60
Garhwal	-	66.08	273.78	736.37	538.11	9.44	1623.78
Chamoli	-	18.76	187.58	478.33	337.65	9.38	1031.70
Tehri	6.37	31.87	108.35	95.61	25.50	-	267.70
Total:	13.14	353.13	1629.91	4111.91	3981.69	66.47	10156.25
Percentage:	0.13	3.48	16.05	40.49	39.20	0.65	100.00

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4.1.3 Distribution of forest area by soil texture classes and districts.

Over-all soil texture in the area tends to be clayey loam. 48.91 percent of the area has 'clayey loam' soil, 28.28 percent of the area has 'sandy loam' soil and 17.94 percent of the area has 'loam' soil. Thus the region does not have any areas requiring specific treatment or choice of species from the point of view of soil texture. District-wise distribution of area by soil texture classes is given in Table No.IV.1.3.

Table No.IV.1.3.

Distribution of forest area by soil texture classes and districts.

Total area : 10,156.25 km^2
Total sample plots : 1235
Area Unit : km^2

Districts	SOIL TEXTURE CLASSES							
	Clayey	Clayey loam	Loam	Sandy loam	Sandy	No soil	Un-recorded	Total
Dehradun	41.51	290.54	34.59	359.71	34.59	20.75	13.84	795.53
Almora	57.10	1046.81	580.51	542.44	9.52	-	19.03	2255.41
Pithoragarh	6.77	1124.32	176.11	291.24	13.55	6.77	6.77	1625.53
Nainital	24.04	985.77	520.94	841.52	176.32	-	8.01	2556.60
Garhwal	-	481.47	472.03	632.52	28.32	-	9.44	1623.78
Chamoli	-	834.74	37.52	140.68	-	9.38	9.38	1031.70
Tehri	-	203.96	-	63.74	-	-	-	267.70
Total	129.42	4967.61	1821.70	2871.85	262.30	36.90	66.47	10156.25
Percentage	1.27	48.91	17.94	28.28	2.59	0.36	0.65	100.00

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4.1.4 Distribution of accessible forest area by soil erosion classes and districts.

Inspite of the hilly terrain, the accessible forest area of the region does not suffer from excessive soil erosion problems. Only 1.30 percent of the area is subjected to heavy erosion. 9.54 percent of the area has moderate erosion and in 88.41 percent of the area, soil erosion is not a problem. Areas having heavy and moderate erosion will need special attention to avoid further degradation of site by taking up soil conservation measures. District-wise distribution of forest area by soil erosion classes is given in Table No.IV.1.4.

Table No.IV.1.4

Distribution of forest area by soil erosion classes and districts.

Total area : 10,156.25 km^2
Total sample plots : 1235
Area Unit : km^2

Districts	EROSION STATUS CLASSES				
	Mild erosion i.e.no erosion or slight erosion where only surface erosion taken place.	Moderate erosion i.e. where small gullies and rills are formed on the top surface of soil	Heavy erosion i.e. areas which have deep gullies, ravines, land slips etc.	Unrecorded	Total
Dehradun	581.08	172.94	27.67	13.84	795.53
Almora	2046.04	171.30	9.52	28.55	2255.41
Pithoragarh	1523.93	81.28	13.55	6.77	1625.53
Nainital	2236.03	272.49	40.07	8.01	2556.60
Garhwal	1416.09	169.93	28.32	9.44	1623.78
Chamoli	966.05	56.27	-	9.38	1031.70
Tehri	210.33	44.62	12.75	-	267.70
Total	8979.55	968.83	131.88	75.99	10156.25
Percentage	88.41	9.54	1.30	0.75	100.00

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4.1.5 Distribution of accessible forest area by grazing incidence classes and districts.

12.96 percent area of the region is subject to heavy grazing, 35.42 percent area to medium grazing and rest of the area to light grazing or no grazing. Heavy grazing is deterimental to forest regeneration and needs to be regulated. District-wise distribution of forest area by grazing incidence classes is given in Table No.IV.1.5.

Table No. IV.1.5.

Distribution of accessible forest area by grazing incidence classes and districts.

Total area : 10,156.25 km^2
Total sample plots 1235
Area Unit : km^2

Districts	GRAZING INCIDENCE					
	Heavy grazing	Medium grazing	Light grazing	No grazing	Un-recorded	Total
Dehradun	214.45	269.79	221.36	69.18	20.75	795.53
Almora	295.01	970.68	647.12	304.53	38.07	2255.41
Pithoragarh	155.78	548.62	521.52	392.84	6.77	1625.53
Nainital	176.32	665.20	1322.38	376.68	16.02	2556.60
Garhwal	207.69	557.00	387.06	472.03	-	1623.78
Chamoli	215.72	497.09	215.72	84.41	18.76	1031.70
Tehri	50.99	89.23	70.11	57.37	-	267.70
Total	1315.96	3597.61	3385.27	1757.04	100.37	10156.25
Percentage	12.96	35.42	33.33	17.30	0.99	100.00

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4.1.6 Distribution of accessible forest area by fire incidence classes and districts.

58.66 percent of the area experiences occasional fires. However, only 2.27 percent area suffers from very heavy fires. This reflects a degree of control on the fires. In 29.63 percent of the area no fire incidence is observed. District-wise distribution of forest area by fire incidence classes is given in Table No.IV.1.6.

Table No.IV.1.6

Distribution of accessible forest area by fire incidence classes and districts.

Total area : 10,156.25 km^2

Total sample plots : 1235

Area Unit : km^2

Districts	FIRE INCIDENCE					
	Very heavy	Frequent	Occasional	No fire	Unrecorded	Total
Dehradun	-	41.51	664.09	69.18	20.75	795.53
Almora	28.55	314.05	1655.86	228.40	28.55	2255.41
Pithoragarh	128.69	203.19	927.91	358.97	6.77	1625.53
Nainital	64.12	152.27	1073.94	1250.25	16.02	2556.60
Garhwal	-	28.32	745.81	840.21	9.44	1623.78
Chamoli	9.38	112.55	628.40	262.61	18.76	1031.70
Tehri	-	6.37	261.33	-	-	267.70
Total	230.74	858.26	5957.34	3009.62	100.29	10156.25
Percentage	2.27	8.45	58.66	29.63	0.99	100.00

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4.1.7 Distribution of accessible forest area by plantation potential and districts.

In 13.13 percent area there is scope for reforestation and augmentation planting. 3.64 percent area has been assessed as unplantable owing to various topographical factors. District-wise distribution of area by plantation potential is given in Table No.IV.1.7.

Table No.IV.1.7

Distribution of accessible forest area by plantation potential and districts.

Total area : 10,156.25 km^2

Total sample plots: 1235

Area Unit : km^2

Districts	PLANTATION POTENTIAL				
	Plantable	Un-plantable	Not applicable	Un-recorded	Total
Dehradun	69.18	48.42	664.09	13.84	795.53
Almora	285.50	76.13	1865.23	28.55	2255.41
Pithoragarh	257.38	81.28	1280.10	6.77	1625.53
Nainital	312.56	88.16	2147.87	8.01	2556.60
Garhwal	217.13	9.44	1397.21	-	1623.78
Chamoli	140.68	28.14	853.50	9.38	1031.70
Tehri	50.99	38.24	178.47	-	267.70
Total	1333.42	369.81	8386.47	66.55	10156.25
Percentage	13.13	3.64	82.57	0.66	100.00

Explanatory note:

Plantation potential was assessed only at those sample plots having tree crown cover density of less than 30%. The maximum permissible slope upto which plantation can be raised was kept as 40° and minimum soil depth was kept at 20 cms. Plantation potential of sample plots having crown density of 30% or more were categorised as 'not applicable'.

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4.1.8 Distribution of accessible tree forest area by size classes and districts.

Accessible tree forest area in the region is 9857.32 km^2 (Table No.IV.1.1).

36.32 percent of the area is under 'small timber' followed by 26.49 percent of the area under 'big timber'. Area under regeneration is only 2.52 percent. The forest crop in the region is comparatively young. District-wise distribution of area by size classes is given in Table No.IV.1.8.

Table No.IV.1.8

Distribution of accessible tree forest area by size class and districts.

Total area : 9857.32 km^2

Total sample plots: 1197

Area Unit : km^2

Districts	SIZE CLASS						
	Regeneration	Pole crop	Small timber	Big timber	Mixed	Un-recorded	Total
Dehradun	6.92	179.86	352.80	103.76	110.68	13.84	767.86
Almora	28.55	247.43	770.83	751.80	409.21	9.52	2217.43
Pithoragarh	40.64	440.24	535.07	419.93	135.46	-	1571.34
Nainital	128.23	601.09	881.59	625.13	256.46	8.01	2500.51
Garhwal	28.32	311.54	679.73	472.03	94.40	-	1586.02
Chamoli	9.38	347.03	309.51	206.34	112.54	-	984.80
Tehri	6.37	140.22	50.99	31.87	-	-	229.45
Total	248.41	2267.41	3580.52	2610.86	1118.75	31.37	9857.32
Percentage	2.52	23.00	36.32	26.49	11.35	0.32	100.00

Explanatory Note:

Regeneration: Crop below 10 cms diameter predominating.
Pole crop : Crop between 10 to less than 20 cms diameter predominating.
Small timber: Crop 20 cms to under 30 cms diameter predominating.
Big timber : Tree with diameter 30 cms and over predominating.
Mixed size : Tree crop with no marked domination of any size class.
class.

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4.1.9 Distribution of accessible tree forest area by regeneration status and districts.

Natural regeneration is absent over 77.68 percent of the area and is inadequate over 8.90 percent area. Only 6.46 percent area has adequate regeneration. This indicates that natural regeneration cannot be relied upon for regeneration of the area. District-wise distribution of accessible tree forest area by regeneration status is given in Table No. IV.1.9.

Table No.IV.1.9

Distribution of accessible tree forest area by regeneration status and districts.

Total area : 9857.32 km^2
Total sample plots: 1197
Area Unit : km^2

Districts	REGENERATION STATUS				
	Adequate	Inadequate	Absent	Un-recorded	Total
Dehradun	6.92	76.10	636.42	48.42	767.86
Almora	85.65	228.40	1731.99	171.30	2217.34
Pithoragarh	108.37	182.87	1171.73	108.37	1571.34
Nainital	168.30	160.29	2027.66	144.26	2500.51
Garhwal	198.25	103.85	1217.84	66.08	1586.02
Chamoli	56.27	112.55	712.81	103.17	984.80
Tehri	12.75	12.75	159.34	44.61	229.45
Total	636.51	876.81	7657.79	686.21	9857.32
Percentage	6.46	8.90	77.68	6.96	100.00

Explanatory note:

Adequate regeneration: Means where 8 or more than 8 seedlings (having diameter between 2 cms to less than 10 cms at breast height) of economically important species occur in a plot of 16 sq.meter area.

Inadequate regeneration: Means where less than 8 seedlings (having diameter between 2 cms to less than 10 cms at breast height), of economically important species occur in a plot of 16 sq.meter area.

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4.1.10 Distribution of accessible tree forest area by 'injury to crop' classes and districts.

30.77 percent of the area is subjected to man-made and un-natural injuries, 7.93 percent to natural injuries and the remaining area is free from injuries. Injuries to crop reduce value of timber, retard the growth and, at times, leads to mortality of the trees. District-wise distribution of accessible tree forest area by 'injury classes' is given in Table No.IV.1.10.

Table No.IV.1.10

Distribution of accessible tree forest area by type of injury to crop and districts.

Total area : 9857.32 km^2
Total sample plots 1197
Area Unit : km^2

Districts	INJURY				
	Natural	Man-made/ Un-natural	Absent	Un-recorded	Total
Dehradun	41.51	214.44	498.07	13.84	767.86
Almora	228.40	732.77	1237.14	19.03	2217.34
Pithoragarh	128.69	548.61	894.04	-	1571.34
Nainital	56.10	488.88	1947.52	8.01	2500.51
Garhwal	113.28	443.71	1029.03	-	1586.02
Chamoli	131.31	515.85	337.64	-	984.80
Tehri	82.86	89.23	57.36	-	229.45
Total	782.15	3033.49	6000.80	40.88	9857.32
Percentage	7.93	30.77	60.88	0.42	100.00

Explanatory note:

Injury was judged by occular estimation in 2 ha. area around the centre of plot, provided the effected trees formed at least 10% of the crop.

Natural Injury: Means injury by wind/snow or flood, climber, lightening, wildlife, borer attack, leaf defoliator or other posts.

Man-made/Un-natural: Injury by girdling/illicit felling, scarring/fire, lopping.

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4.1.11 Distribution of accessible tree forest area by forest types and districts.

There are ten forest types identified in the region. The forest types occurring over extensive tracts are - Miscellaneous forests over 28.97 percent area, Chir-pine forest type over 4.25 percent area, Upland hardwoods forest type over 22.87 percent area and Sal forest type over 14.42 percent area. The district-wise distribution of accessible tree forest area by forest types is given in Table No.IV.1.11.

4.1.12 Distribution of accessible tree forest area by forest types and canopy density classes

There are three recognized canopy density classes in the 'forest area'

1. 70% and above - Closed forest
2. 30% to 69% - Medium forest
3. 5% to 29% - Open forest.

Area with canopy density below 5% is not considered 'forest area'. 'Forest type-wise the density varies between 66 percent to 44 percent. The density is 49.7 percent. The percentage of area under 'closed' 'medium' and 'Open' forest is 24%, 61% and 15% respectively.

The distribution of accessible tree forest area by forest types and canopy density classes is given in Table No.IV.1.12.

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Table No.IV.1.11

Distribution of accessible tree forest area by forest types and districts.

Total area : 9857.32 km^2

Total sample plots: 1197

Area Unit : km^2

Districts	FOREST TYPES											
	Upland hard-woods	Sal	Misc. forests	Fir	Chir-pine	Hardwood mixed with conifers	Deodar	Mixed coni-fers	Khair forests	Teak	Un-record-ed	Total
Dehradun	62.26	477.32	214.45	-	-	-	-	-	-	-	13.83	767.86
Almora	456.79	28.55	133.23	19.03	1427.47	142.75	-	-	-	-	9.52	2217.34
Pithoragarh	507.98	74.50	392.84	-	474.11	101.60	6.77	6.77	6.77	-	-	1571.34
Nainital	248.45	400.72	1330.40	-	200.36	88.16	-	-	136.25	96.17	-	2500.51
Garhwal	254.90	434.27	670.28	28.32	66.08	122.73	-	-	-	9.44	-	1586.02
Chamoli	722.19	-	-	9.38	196.96	56.27	-	-	-	-	-	984.80
Tehri	63.74	6.37	114.73	-	25.49	19.12	-	-	-	-	-	229.45
Total	2316.31	1421.73	2855.93	56.73	2390.47	530.63	6.77	6.77	143.02	105.61	23.35	9857.32
Percentage	23.50	14.42	28.97	0.58	24.25	5.38	0.07	0.07	1.45	1.07	0.24	100.00

Explanatory note:

Species comprising more than 50% of crop was recognised as pure forest type of that species Hardwood mixed with conifers was the type in which conifers, broad leaved species occur in more or less in same proportions. (See appendix-II, description of codes for forest types).

Table No.IV.1.12

Distribution of accessible tree forest area by forest types, canopy density classes and districts.

Total area : 9686.99
Total sample plots : 1176
Area Unit : km^2

Districts	CANOPY DENSITY (Forest type wise)														
	Upland hardwoods			Sal			Misc. forests			Fir			Chir-pine		
	70% & above	30% to 69%	5% to 29%	70% & above	30% to 69%	5% to 29%	70% & above	30% to 69%	5% to 29%	70% & above	30% to 69%	5% to 29%	70% & above	30% to 69%	5% to 29%
Dehradun	-	20.75	41.51	269.79	186.78	20.75	55.34	131.43	27.67	-	-	-	-	-	-
Almora	171.30	218.88	66.61	9.52	19.03	-	47.58	57.10	28.55	-	9.52	9.52	237.91	932.61	228.39
Pithoragarh	60.96	365.74	81.28	13.55	54.19	6.77	27.09	291.24	74.50	-	-	-	40.64	325.10	94.82
Nainital	56.10	168.30	24.04	200.36	168.30	32.06	440.80	609.10	176.33	-	-	-	24.04	152.28	24.04
Garhwal	84.97	103.85	66.09	141.61	273.78	18.88	66.08	490.91	113.29	-	28.32	-	-	47.20	18.88
Chamoli	168.82	478.33	75.03	-	-	-	-	-	-	9.38	-	-	18.76	121.93	56.27
Tehri	12.75	38.24	12.75	-	6.37	-	-	76.49	38.24	-	-	-	-	6.37	19.12
Total	554.90	1394.09	367.31	634.83	708.45	78.46	636.89	1656.27	458.58	9.38	37.84	9.52	321.35	1585.49	441.52
Density percentage (forest-type-wise)	49.5			60.8			49.0			46.2			44.5		

Table continued .....

Table No.IV.1.12 contd....

Districts	CANOPY DENSITY (Forest type wise)																				
	Hardwood mixed with co nifers			Deodar			Mixed conifers			Khair forests			Teak			Unrecorded			Total		
	70% & above	30% to 69%	5% to 29%	70% & above	30% to 69%	5% to 29%	70% & above	30% to 69%	5% to 29%	70% & above	30% to 69%	5% to 29%	70% & above	30% to 69%	5% to 29%	70% & above	30% to 69%	5% to 29%	70% & above	30% to 69%	5% to 29%
Dehradun	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.92	6.92	-	332.05	345.88	89.93
Almora	28.55	104.68	9.52	-	-	-	-	-	-	-	-	-	-	-	-	-	9.52	-	494.86	1351.34	342.59
Pithora-g-arh	6.77	81.28	13.55	-	6.77	-	-	6.77	-	-	-	6.77	-	-	-	-	-	-	149.01	1131.09	277.69
Nainital	8.01	72.13	8.01	-	-	-	-	-	-	32.06	72.13	24.04	48.09	32.06	-	-	-	-	809.46	1274.30	288.52
Garhwal	28.32	66.08	28.32	-	-	-	-	-	-	-	-	-	-	9.44	-	-	-	-	320.98	1019.58	245.46
Chamoli	-	46.90	9.38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	196.96	647.16	140.68
Tehri	-	19.12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12.75	146.59	70.11
Total	71.65	390.19	68.78	-	6.77	-	-	6.77	-	32.06	72.13	30.81	48.09	41.50	-	6.92	16.44	-	2316.07	5915.94	1454.98
Density percentage (forest type-wise)		46.0			44.0			44.0			47.6			66.0			56.1				
Percentage area under different density classes																			23.91	61.07	15.02
Overall density percentage																					49.7

Note: 1. District Almora: Tree forest area of 28.55 km^2 of 3 plots fall in land use other than the above density classes.

2. District Pithoragarh: Tree forest area of 13.55 km^2 of 2 plots fall in land use other than the above density classes.

3. District Nainital: Tree forest area of 128.23 km^2 of 16 plots fall in land use other than the above density classes.

4.2 Bamboo area and inventory

In the hill region of U.P. Bamboo occurs in Garhwal district over an area of 46256 ha. 49 sample points over this area were inventoried and the results are given below. The bamboo species occuring in the area are Dendrocalamus strictus and Bambusa arundicacea.

Table No. 4.2.1

Distribution of bamboo plots and area by Bamboo species

Species	Nof.of plots	Area (ha.)
Dendrocalamus Strictus	48	45312
Bambusa arundinacea	1*	944
Total	49	46256

* Since only 1 plot occurs in this species it has been clubbed with Dendrocalamus strictus for subsequent analysis.

Table No. 4.2.2

Distribution of Bamboo plots and area by quality classes

Quality Classes*	No. of plots	Area in ha.
I	32	30208
II	12	11328
III	5	4720
Total	49	46256

Bamboo quality class	Description
I	Average culm height 6 metres or more for Dendrocalamus Strictus and 14 metres or more for Bambusa arundinacea.
II	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.
III	Average culm height 2 metres or more but less than 4 metres for Dendrocalamus strictus and 2 metres and more but less than 10 metres for Bambusa arundinacea. (The quality of other species of bamboo will be decided on the lines of Dendrocalamus strictus).

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Table No.4.2.3

Mean number of clumps/ha by size class

Size class*	No. of clumps/ha
Small	441.0
Medium	52.5
Large	1.5

*Clump size class	Description
Small	All clumps less than 1 metre average diametre.
Medium	Clumps of average diameter between 1 metre to less than 2 metres
Large	Clumps of average diameter 2 metres and over.

Table No. 4.2.4

Mean number of clumps per ha. by quality classes

Quality classes	No of clumps/ha
I	314
II	143
III	38
Mean number of clumps per ha	224

Table No.4.2.5

Mean number of culms/clump by quality classes

Quality class	No. of culms/clump
I	9.27
II	14.46
III	11.21

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Table No.4.2.6

Total number of culms by quality classes

Unit: no in 000

Sl.No.	Quality class	No. of culms
1.	I	87929
2.	II	23424
3.	III	2011
Grand Total		113364

Table No.4.2.7

Total number of bamboo culms (000) by soundness

Quality	Sound	Damaged	Decayed	Total
I	37551	28845	21533	87929
II	2213	14297	6914	23424
III	368	1218	425	2011
Total	40132	44360	28872	113364
Percentage	35.4	39.1	25.5	100

The culm diameter is between 2 to 5 cm over the region. From the table 4.2.7 it can be deduced that total number of useable bamboo culms are 62312000. (Assuming two damaged culms as one useable culm and rejecting the decayed culms.)

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4.3 Stand and stock tables

Distribution of volume per hectare (stock ta-ble) and stems per hectare (stand table) by species and diameter classes in accessible tree forest area of the region are given forest type-wise from table No.IV.2.1 to IV.2.18.

Abstract of the forest type-wise stock and stand table is given below.

Forest type	Total area ha.	Vol/ha m^3	Stems/ha
1. Fir	5673	176.366	224.325
2. Deodar	677	137.166	180.000
3. Chir pine	239047	79.425	171.412
4. Mixed conifers	677	-	-
5. Hardwood mixed with conifers.	53063	92.636	281.837
6. Upland hardwood	231631	112.486	370.619
7. Teak	10561	69.278	246.156
8. Sal	142173	175.303	331.608
9. Khair	14302	36.100	229.450
10. Miscellaneous	285593	96.847	250.892
Total	983397*	106.682	272.370

* Exclusive of 2335 ha of accessible forest area because enumeration plots could not be laid.

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4.3.1 Analysis of growing stock in forest types

i) Fir Forest type: This type occurs over 5673 ha. out of the 985732 ha. of accessible tree forest area. Thus accounting for less than 0.6 percent of the area. Hence the presence of Fir Forest type is not significant in the hill region. Besides Fir, the other species occuring in this type are Rhododendron arboreum, Quercus semecarpifolia and Quercus dilatata. The overall canopy density is 46.2 percent. The growing stock is 176.366 m^3/ha. The crop has 20.7m^2 basal area and 224.325 stems per hectare. The crop diameter corresponding to the above basal area and number of stems is 34 cm.

ii) Deodar Forest Type: This forest type occurs over less than 0.01 percent of the accessible tree forest area. (677 ha. out of 985732 ha.). The entire area falls within Pithoragarh districts. Volume per ha. is 137.166 m^3 and stems per ha are 180.000 Canopy density of this forest type is 44 percent with crop diameter of 31 cm. All these figures are based upon one sample plot and hence liable to indeterminate inaccuracy.

iii) Chir pine Forest Type : This type occurs over 239047 ha. of area and expressed as percentage of accessible tree forest area (985732 ha.) amounts to 24.25 percent. Thus this forest type is one of the most extensive forest type occuring in Hill region of U.P. The over all canopy density is 44.5 percent. Per hectare volume in the type is 79.425 m^3 of which 92.6 percent is Chir pine. Other species are Quercus incana, Rhododendron arboreum, Lyonia ovalifolia, Syzygium cumini, Shorea robusta, Ougeinia dalbergiodes, Lannea coromandelica, Terminalia crenulata etc.

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The crop has 10.87 m^2 basal area and 171.412 stems per hectare. The crop diameter corresponding to the above basal area and number of stems is 28 cms. The chir pine forests of hill region of U.P. are of quality II/III. Comparing the stocking of these forests to the normal stocking given in yield tables for 28 cm dia crop the normal II/III quality basal area is 24.2 m^2 and 367 stems per hectare. The comparison shows that the chir forest is only 45 percent stocked.

iv) Mixed Conifers Forest Type: This forest type occurs over 677 ha. of accessible tree forest area of 985732 ha. This forest type is also confined to Pithoragarh district. Only one plot was sampled and per chance no trees were tallied in the sample plot. Hence no stand and stock figures can be given. However, the figures of Fir and Deodar Forest type can be considered indicative of this forest type.

v) Hardwood mixed with Conifers Forest Type: This forest type occurs over 5.4 percent (53063 ha.) of the accessible tree forest area (985732 ha.). The canopy cover of this forest type is 46 percent. Growing stock, volume per hectare is 92.636 m^3. Pinus roxburghii and Quercus incana account for 36.0 percent and 17.6 percent respectively. Other species are Abies pindrow (6.9%), Quercus semecarpifolia (8.0%), Rhododendron arboreum (5.7%) Shorea robusta (3.2%), Quercus dilatata (4.2%) Lyonia ovalifolia (2.1%). Rest of the of species constitute 12.8% of the growing stock. The crop has 13.8 m^2 basal area and 281.837 stems per hectare. The crop diameter corresponding to the above basal area and number of stems is 25 cm.

vi) Upland hardwood Forest Type: This type occurs over 231631 ha. out of the 985732 ha. of the accessible tree forest area.

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Thus accounting for 23.5 percent of the area. The over all canopy density is 49.5 percent. Growing stock per hectare is 112.486 m^3. The oaks and Rhododendron account for 63.5 percent of the growing stock. Conifers account for less than 5 percent of the growing stock and rest of the species are broad leaved. The crop has 18.9 m^2 basal a rea and 370.619 stems per hectare, thus having a crop diameter of 25 cm.

vii) Teak Forest Type: This type occurs over 1.07 percent of the accessible tree forest area (10561 ha. out of 985732 ha.). Most of the area falls in Nainital district. The overall canopy density is 66.0 percent which is highest amongst the various forest types within the Hill region of U.P. Volume of growing stock per hectare is 69.278 m^3. The species constituting this volume are Tectona grandis (45.5 percent), Shorea robusta (24.3 percent) Eucalyptus species (6.4 percent) and rest of the species constitute 23.8 percent. The crop has 8.3 m^2 basal area and 246.156 stems per hectare. The crop diameter corresponding to the above basal area and number of stems is 21 cms.

viii) Sal Forest Type: Sal forest type occurs over 142173 ha. out of the 985732 ha. of accessible tree forest area. Thus accounting for 14.4 percent of the area. The over all canopy density is 60.8 percent. Growing stock per hectare is 175.303 m^3. Shorea robusta accounts for 74.3 percent of this volume. Some of the other species are Terminalia crenulata (8.3 percent), Anogeissus latifolia (1.7 percent) Syzygium cumini (1.7 percent) and Ougeinia dalbergiodes (1.8 percent). The crop has 17.1 m^2 basal area and 331.608 stems per hectare. The crop diameter corresponding to the above basal area and number of stems is 26 cms.

ix) Khair Forest Type: This type occurs over 1.45 percent of the accessible tree forest area. (14302 ha. out of 985732 ha). The

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entire area falls in Nainital district. The overall canopy density is 47.6 percent. Volume of growing stock per hectare is 36.100 m^3 lowest amongst the forest types in hill region. Acacia catechu constitutes 55.8 percent of the growing stock. The other significant species is Dalbergia sissoo. (21.4 percent). Eucalyptus(3 percent) Teak (0.4 percent) and other species constitute the rest. The basal area of the crop is 6.6 m^2 with 229.450 stems per hectare. Thus the crop diameter is 19 cms. This indicates that the crop is relatively young.

x) Miscellaneous Forest Type: This type is most abundant in the region and occurs over an area of 285593 ha. accounting for 28.97 percent of the total accessible tree forest area.(985732 ha.). The canopy cover of this forest type is 49.0 percent. Volume per hectare is 96.847 m^3. Species constituting 1 to 10 percent of the volume are Acacia catechu (1.4 percent), Anogeissus latifolia (6.2 percent), Dalbergia sissoo (3.2 percent), Eucalyptus (1.5 percent). Lannea coromandelica (4.7 percent), Ougeinia dalbergiodes (2.8 percent), Pinus roxburghii (1.1 percent) and Syzygium cumini (3.7 percent). Rest of the species, each constituting less than 1 percent volume, account for 45.2 percent volume. The crop has 11.1 m^2 basal area and 250.892 stems per hectare. The crop diameter corresponding to the above basal area and number of stems is 24 cms.

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4.3.2 Analysis of growing stock in districts

The volume per hectare and stems per hectare by species and diameter classes in accessible treeforest area districtwise is given in table No.IV.2.19 to IV.2.32. These tables are given at the end of this chapter. The abstract of the tables is given below:

Sl. No.	District	Area ha.	Vol./ha.	Stems/ha
1.	Almora	220782*	95.128	256.889
2.	Chamoli	98480	93.430	348.293
3.	Dehradun	75403*	133.938	318.384
4.	Garhwal	158602	124.610	280.092
5.	Nainital	250051	107.521	263.301
6.	Pithoragarh	157134	102.339	230.163
7.	Tehri	22945	81.660	278.867
	Total	983397	106.682	272.370

* Exclusive of 952 ha. in Almora district and 1383 ha. in Dehradun district where the enumeration plot could not be laid.

From the above table it is observed that volume perhectare varies from 81.660 m^3 in Tehri district to 133.938 m^3 in Dehradun district. Number of stems varies from 230 per hectare in Pithoragarh district to 348 per hectare in Chamoli district.

The whole of accessible tree forest area sampled has a total growing stock of 104.9 million m^3 and 267.8 million stems. Per hectare volume and stems in the accessible forest area is 106.682 m^3. and 272.37 stems respectively.

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4.4 Sampling error

Standard error percent of growing stock district-wise is given below:-

District	Total Volume million m^3	S.E. percent
Almora	21.0	7.05
Chamoli	9.2	10.12
Dehradun	10.1	9.16
Garhwal	19.7	9.79
Nainital	26.9	7.47
Pithoragarh	16.1	9.22
Tehri	1.9	22.34
Total	104.9	3.52

The standard error expressed as the percentage of growing stock in the hill region is 3.52 percent.

Limitation of the survey

The above table indicates that the results of the survey have a precision within ± 10% at 95% probability level for the hill region surveyed in Uttar Pradesh. District-wise break-up leads to loss of precision and the standard error percentage goes as high as 22.34% in case of Tehri district. It is therefore, clear that the results of this survey cannot be used for estimating, within reasonable precision limits, the growing stock in a district. However, the results of this survey could be used as the basis for designing a detailed survey at district level.

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4.5 Household fuel consumption in the Nainital and Pithoragarh districts of hill region

Information on the quantity and pattern of fuel consumption in rural households of the survey area was also collected while doing the main forest inventory works. This information was collected by direct enquiry method from four representative households of each village near to camping places. This information so collected was compiled and is given in Table No. IV.5. Consumption pattern as far as extent of fuel wood removed from forest is concerned may very depending upon distance of village from the nearest forest. The information gives indica-tion about the rural fuelwood consumption in the vicinity of forests.

From the table, it is seen that on the average per capita per annum fuelwood — agricultural waste consumption in Nainital & Pithoragarh districts is 498.9 kgs and 965.4 kgs. respectively. In Pithoragarh district agricultural waste is not used.

Other sources of energy used are kerosene oil. The per capita per annum consumption is 8.3 litres and 7.66 litres in Nainital and Pithoragarh districts respectively. Kerosene oil is mainly used for lighting purpose.

List of villages sampled for house-hold fuel consumption are:-

District	Name of village	No. of house-holds sampled
Nainital	Syanli	4
	Bhur Mholia	4
	Tiliapura	4
	Gosi Kuan	4
Pithoragarh	Kharij	4
	Duti Bazar	4
	Chori Bagar	4
	Baram	4

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Table No. IV.5

Per capita fuel consumption in rural areas of Nainital and Pithoragarh districts of U.P.

S.No.	District	No of House hold sampled	Total family members	Nature of fuel consumed per capita per annum: From trees: Total Kg	From trees: % from Govt. forest	From trees: % from private forest	Agricultural waste Totally from private areas in kgs	Total of colm 5&8	K.Oil in ltrs
1	2	3	4	5	6	7	8	9	10
1.	Nainital	16	199	85410	100%	-	13870	99280	1646
	Per capita			429.2	100%	-	69.7	498.9	8.3
2.	Pithoragarh	16	107	103295	94%	6%	-	103295	814
	Per capita			965.4	94%	6%	-	965.4	7.6

Note: The above data was collected from rural areas located in the vicinity of forest lands. Therefore this consumption pattern applies to such areas only.

Table No. IV.2.1

Distribution of volume per hectare by species and diameter classes in accessible tree forest area.

Forest type : Fir

Area : 5673 ha.

Unit : m^3

S.No.	Species name	DIAMETER CLASSES (in cms) 10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
1.	Abies pindrow	7.147	3.786	8.357	7.020	11.248	32.304	23.169	28.581	121.612	69.0
2.	Quercus dilatata	0.267	0.920	-	2.431	5.677	-	-	9.087	18.382	10.4
3.	Quercus semicarpifolia	0.309	1.752	2.701	8.906	9.509	-	-	-	23.177	13.1
4.	Rhododendron arboreum	2.035	2.411	0.546	-	-	-	-	-	4.992	2.8
5.	Rest of the species	6.230	1.973	-	-	-	-	-	-	8.203	4.7
	Total:-	15.988	10.842	11.604	18.357	26.434	32.304	23.169	37.668	176.366	
	%	9.0	6.1	6.6	10.4	15.0	18.3	13.2	21.4		100.0

Table No. IV.2.2

Distribution of stems per hectare by species and diameter classes in accessible tree forest area

Forest type : Fir

Area : 5673 ha

Unit : No. of stems

S.No.	Species name	DIAMETER CLASSES (in cms) 10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
1.	Abies pindrow	26.704	8.336	9.973	4.981	4.992	9.974	4.992	4.992	74.944	33.4
2.	Quercus dilatata	3.328	4.992	-	1.664	3.328	-	-	1.664	14.976	6.7
3.	Quercus semecarpifolia	3.307	4.960	3.307	6.646	4.992	-	-	-	23.212	10.4
4.	Rhododendron arboreum	36.460	14.913	1.653	-	-	-	-	-	53.026	23.6
5.	Rest of the species	48.204	9.963	-	-	-	-	-	-	58.167	25.9
	Total :-	118.003	43.164	14.933	13.291	13.312	9.974	4.992	6.656	224.325	-
	%	52.6	19.3	6.7	5.9	5.9	4.4	2.2	3.0	-	100.0
	Basal area (cm^2)	20852	21188	14367	21138	31627	33096	22054	42343	206668	

Crop dia = 34 cms.

Table No. IV.2.3

Distribution of volume per hectare by species and diameter classes in accessible tree forest area.

Forest type : Deodar

Area : 677 ha.

Unit : m^3

S.No.	Species name	DIAMETER CLASSES (in cms)									
		10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
1.	Cedrus deodara	2.356	12.487	70.078	31.755	-	-	-	-	116.676	85.1
2.	Pinus roxburghii	0.669	1.755	-	15.744	-	-	-	-	18.168	13.2
3.	Rest of the species	2.322	-	-	-	-	-	-	-	2.322	1.7
	Total:-	5.347	14.242	70.078	47.499	-	-	-	-	137.166	
	%	3.9	10.4	51.1	34.6	-	-	-	-		100.0

Table No. IV.2.4

Distribution of stems per hectare by species and diameter classes in accessible tree forest area.

Forest type : Deodar

Area : 677 ha.

Unit : No. of stems

S.No.	Species name	DIAMETER CLASSES (in cms)									
		10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
1.	Cedrus deodara	10.000	20.000	70.000	20.000	-	-	-	-	120.000	66.7
2.	Pinus roxburghii	20.000	10.000	-	10.000	-	-	-	-	40.000	22.2
3.	Rest of the species	20.000	-	-	-	-	-	-	-	20.000	11.1
	Total:-	50.000	30.000	70.000	30.000	-	-	-	-	180.000	
	%	27.7	16.7	38.9	16.7	-	-	-	-	-	100.0
	Basal area (cm^2)	8836	14726	67348	47713	-	-	-	-	138623	

Crop dia = 31 cms.

Table No. IV.2.5

Distribution of volume per hectare by species and diameter classes in accessible tree forest area.

Forest type : Chirpine
Area : 239047 ha.
Unit : m^3

S.No.		DIAMETER CLASSES (in cms)									
		10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
1.	Lannea coromandelica	0.003	-	-	-	-	-	-	-	0.003	-
2.	Lyonia ovalifolia	0.301	0.229	0.065	-	-	-	-	-	0.595	0.8
3.	Ougeinia dalbergiodes	0.014	0.009	-	-	0.072	-	-	-	0.095	0.1
4.	Pinus roxburghii	3.404	10.713	17.316	18.013	16.544	5.024	1.867	0.654	73.535	92.6
5.	Quercus dilatata	0.002	-	-	-	-	-	-	-	0.002	-
6.	Quercus incana	0.291	0.307	0.292	0.254	0.070	-	-	-	1.214	1.5
7.	Rhododendron arboreum	0.251	0.233	0.143	0.053	0.058	0.078	0.106	-	0.922	1.2
8.	Shorea robusta	0.095	0.085	0.042	-	-	-	-	-	0.222	0.3
9.	Syzygium cumini	0.074	0.195	0.074	0.113	0.056	-	-	-	0.512	0.6
10.	Terminalia crenulata	0.013	-	-	-	-	-	-	-	0.013	-
11.	Rest of the species	1.009	0.351	0.187	0.374	0.308	0.083	-	-	2.312	2.9
	Total:-	5.457	12.122	18.119	18.807	17.108	5.185	1.973	0.654	79.425	
	%	6.9	15.3	22.8	23.7	21.5	6.5	2.5	0.8		100.0

Table No. IV.2.6

Distribution of stems per hectare by species and diameter classes in accessible tree forest area.

Forest type : Chirpine
Area : 239047 ha.
Unit : No. of stems

S.No.	Species name	DIAMETER CLASSES (in cms) 10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
1.	Lannea coromandelica	0.072	-	-	-	-	-	-	-	0.072	0.1
2.	Lyonia ovalifolia	6.982	1.348	0.171	-	-	-	-	-	8.501	5.0
3.	Ougeinia dalbergiodes	0.173	0.031	-	-	0.031	-	-	-	0.235	0.1
4.	Pinus roxburghii	53.456	35.512	23.989	13.505	7.475	1.560	0.420	0.113	136.030	79.4
5.	Quercus incana	4.470	1.396	0.538	0.266	0.040	-	-	-	6.710	3.9
6.	Quercus dilatata	0.040	-	-	-	-	-	-	-	0.040	-
7.	Rhododendron arbo-reum	4.970	1.298	0.387	0.082	0.048	0.048	0.048	-	6.881	4.0
8.	Shorea robusta	0.671	0.174	0.040	-	-	-	-	-	0.885	0.5
9.	Syzygium cumini	0.779	0.547	0.093	0.093	0.031	-	-	-	1.543	0.9
10.	Terminalia crenulata	0.062	-	-	-	-	-	-	-	0.062	-
11.	Rest of the species	7.888	1.708	0.325	0.346	0.155	0.031	-	-	10.453	6.1
	Total:-	79.563	42.014	25.543	14.292	7.780	1.639	0.468	0.113	171.412	
	%	46.4	24.5	14.9	8.3	4.5	1.0	0.3	0.1	-	100.0
	Basal area (cm^2)	14060	20624	24575	22730	18484	5439	2068	719	108699	

Crop dia = 28 cms.

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Table No. IV.2.7

Distribution of volume per hectare by species and diameter classes in accessible tree forest area

Forest type : Hardwoods mixed with conifer

Area : 53063 ha.

Unit : m^3

S.No.	Species name	DIAMETER CLASSES (in cms) 10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
1.	Abies pindrow	0.689	0.694	2.210	1.161	1.020	0.641	-	-	6.415	6.9
2.	Lannea coromandelica	0.224	0.171	-	-	-	-	-	-	0.395	0.4
3.	Lyonia ovalifolia	0.992	0.453	0.244	-	0.238	-	-	-	1.977	2.1
4.	Cedrus deodara	0.089	-	0.666	0.673	1.849	-	-	-	3.277	3.5
5.	Ougeinia dalbergiodes	0.238	0.050	-	-	-	-	-	-	0.288	0.3
6.	Pinus roxburghii	1.300	4.257	9.378	9.044	4.056	5.278	-	-	33.313	36.0
7.	Quercus dilatata	0.079	0.198	0.194	-	0.384	-	0.699	2.354	3.908	4.2
8.	Quercus incana	3.087	3.184	2.140	3.454	0.973	0.354	2.236	0.855	16.283	17.6
9.	Quercus semicarpifolia	0.275	0.522	0.265	0.495	1.503	1.032	1.237	2.070	7.399	8.0
10.	Rhododendron arboreum	1.617	1.458	0.921	0.711	0.581	-	-	-	5.288	5.7
11.	Shorea robusta	0.912	0.603	1.164	0.299	-	-	-	-	2.978	3.2
12.	Syzygium cumini	0.081	0.071	-	-	-	-	-	-	0.152	0.2
13.	Terminalia crenulata	0.384	0.403	0.216	-	-	-	-	-	1.003	1.1
14.	Rest of the species	4.828	1.396	1.271	0.471	0.612	0.348	-	1.034	9.960	10.8
	Total:-	14.795	13.460	18.719	16.308	11.216	7.653	4.172	6.313	92.636	
	%	16.0	14.5	20.2	17.6	12.1	8.3	4.5	6.8		100.0

Table No. IV.2.8

Distribution of stems per hectare by species and diameter classes in accessible tree forest area.

Forest type : Hardwoods mixed with conifers

Area : 53063 ha.

Unit : No. of stems

S.No.	Species name	DIAMETER CLASSES (in cms) 10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
1.	Abies pindrow	2.510	1.451	2.660	0.885	0.385	0.178	-	-	8.069	2.9
2.	Cedrus deodara	0.356	-	0.534	0.356	0.712	-	-	-	1.958	0.7
3.	Lannea coromandelica	2.036	0.534	-	-	-	-	-	-	2.570	0.9
4.	Ougeinia dalbergiodes	2.038	0.147	-	-	-	-	-	-	2.185	0.8
5.	Lyonia ovalifolia	22.182	2.349	0.680	-	0.207	-	-	-	25.418	9.0
6.	Pinus roxburghii	19.991	13.799	13.149	6.707	1.692	1.611	-	-	56.949	20.2
7.	Quercus dilatata	0.887	0.708	0.355	-	0.178	-	0.178	0.356	2.663	0.9
8.	Quercus incana	44.985	14.737	4.331	3.586	0.701	0.178	0.741	0.207	69.466	24.7
9.	Quercus semicarpifolia	3.217	1.833	0.355	0.325	0.712	0.356	0.295	0.295	7.387	2.6
10.	Rhododendron arboreum	29.802	8.490	2.652	1.006	0.621	-	-	-	42.571	15.1
11.	Shorea robusta	6.919	1.477	1.130	0.147	-	-	-	-	9.673	3.4
12.	Syzygium cumini	1.092	0.185	-	-	-	-	-	-	1.277	0.5
13.	Terminalia crenulata	2.358	0.599	0.185	-	-	-	-	-	3.142	1.1
14.	Rest of the species	27.956	7.002	2.457	0.475	0.295	0.147	-	0.177	48.509	17.2
	Total :-	176.329	53.311	28.488	13.487	5.503	2.470	1.214	1.035	281.837	
	%	62.6	19.0	10.1	4.7	2.0	0.9	0.4	0.3	-	100.0
	Basal area (cm^2)	31089	26169	27409	21450	13074	8196	4028	6584	137999	

Crop dia = 25 cms.

Table No. IV.2.9

Distribution of volume per hectare by species and diameter classes in accessible tree forest area

Forest type : Up-land hardwoods
Area : 231631 ha.
Unit : m^3

S.No.	Species name	DIAMETER CLASSES (in cms) 10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
1.	Abies pindrow	0.034	0.032	0.206	0.189	0.107	0.109	0.175	0.306	1.158	1.0
2.	Acacia catechu	0.007	0.021	0.028	-	-	-	-	-	0.056	-
3.	Anogeissus latifolia	-	0.026	-	0.204	-	-	-	-	0.230	0.2
4.	Lannea coromandelica	0.013	0.031	-	-	-	-	-	-	0.044	-
5.	Lyonia ovalifolia	1.525	1.869	1.491	1.704	0.396	0.388	-	0.283	7.026	6.3
6.	Ougeinia dalbergiodes	0.022	0.024	0.036	-	-	-	-	-	0.082	0.1
7.	Pinus roxburghii	0.157	0.420	0.465	0.357	1.064	0.934	-	-	3.397	3.0
8.	Quercus dilatata	0.824	0.652	0.735	0.702	1.055	1.697	1.283	0.020	8.968	8.0
9.	Quercus incana	3.703	4.275	4.594	3.967	3.765	2.300	2.068	5.095	29.767	26.5
10.	Quercus semicarpifolia	0.928	1.925	2.563	2.365	2.594	2.105	1.999	3.966	18.445	16.4
11.	Rhododendron arboreum	2.735	3.416	2.806	1.993	1.546	0.908	0.282	0.469	14.155	12.6
12.	Shorea robusta	0.008	0.064	0.097	0.079	0.379	0.194	-	-	0.821	0.7
13.	Syzygium cumini	0.066	0.138	0.189	0.111	-	-	-	-	0.504	0.4
14.	Terminalia cremulata	0.011	-	0.104	-	0.307	0.282	-	0.536	1.240	1.1
15.	Rest of the species	8.836	3.299	2.736	2.158	1.594	1.694	1.885	4.391	26.593	23.7
	Total:-	18.869	16.192	16.050	13.199	12.807	10.611	7.692	17.066	112.486	
	%	16.8	14.4	14.3	11.7	11.4	9.4	6.8	15.2	-	100.0

Table No. IV.2.10

Distribution of stems per hectare by species and diameter classes in accessible tree forest area

Forest type : Upland hardwoods
Area : 231631 ha.
Unit : No. of stems.

S.No.	Species name	DIAMETER CLASSES (in cms) 10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
1.	Abies pindrow	0.132	0.082	0.230	0.134	0.051	0.031	0.044	0.044	0.748	0.2
2.	Acacia catechu	0.041	0.083	0.041	-	-	-	-	-	0.165	0.1
3.	Anogeissus latifolia	-	0.044	-	0.088	-	-	-	-	0.132	0.1
4.	Lannea coromandelica	0.103	0.082	-	-	-	-	-	-	0.185	0.1
5.	Ougeinia dalbergiodes	0.220	0.088	0.041	-	-	-	-	-	0.349	0.1
6.	Lyonia ovalifolia	29.576	9.866	3.696	1.467	0.358	0.235	-	0.096	45.294	12.2
7.	Pinus roxburghii	2.789	1.400	0.586	0.270	0.492	0.293	-	-	5.830	1.6
8.	Quercus incana	57.347	18.686	8.828	4.089	2.409	1.001	0.639	0.943	93.942	25.3
9.	Quercus dilatata	11.942	2.672	1.340	0.629	0.566	0.577	0.311	0.285	18.322	4.9
10.	Quercus semicarpifolia	10.571	6.236	3.932	1.850	1.358	0.704	0.521	0.485	25.657	6.9
11.	Rhododendron arboreum	50.001	19.067	7.414	3.055	1.575	0.613	0.149	0.195	82.069	22.1
12.	Syzygium cumini	0.838	0.352	0.249	0.073	-	-	-	-	1.512	0.4
13.	Shorea robusta	0.044	0.126	0.085	0.041	0.124	0.041	-	-	0.461	0.1
14.	Terminalia crenulata	0.102	-	0.072	-	0.083	0.041	-	0.041	0.339	0.1
15.	Rest of the species	69.747	16.089	5.336	2.018	0.881	0.623	0.458	0.462	95.614	25.8
	Total:-	233.453	74.873	31.850	13.714	7.897	4.159	2.122	2.551	370.619	
	%	63.0	20.2	8.6	3.7	2.1	1.1	0.6	0.6	-	100.0
	Basal area (cm^2)	41255	36753	30643	21811	18762	13801	9375	16229	188629	

Crop dia = 25 cms.

Contents

Table No. IV.2.11

Distribution of volume per hectare by species and diameter classes in accessible tree forest area

Forest type : Teak

Area : 10561 ha.

Unit : m^3

S. No.	Species name	DIAMETER CLASSES (in cms)									
		10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
1.	Eucalyptus species	3.618	0.853	-	-	-	-	-	-	4.471	6.4
2.	Shorea robusta	-	-	-	-	2.173	-	5.579	9.075	16.827	24.3
3.	Tectona grandis	15.050	8.416	0.799	3.515	-	3.724	-	-	31.504	45.5
4.	Rest of the species	2.396	1.900	0.863	3.073	3.532	1.795	2.917	-	16.476	23.8
	Total:-	21.064	11.169	1.662	6.588	5.705	5.519	8.496	9.075	69.278	
	%	30.4	16.1	2.4	9.5	8.2	8.0	12.3	13.1		100.0

Table No. IV.2.12

Distribution of stems per hectare by species and diameter classes in accessible tree forest area.

Forest type : Teak

Area : 10561 ha.

Unit : No. of stems.

S.No.	Species name	DIAMETER CLASSES (in cms) 10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
1.	Eucalyptus species	46.290	3.035	-	-	-	-	-	-	49.325	20.0
2.	Shorea robusta	-	-	-	-	0.759	-	0.759	0.759	2.277	0.9
3.	Tectona grandis	136.746	19.730	0.759	1.518	-	0.759	-	-	159.512	64.8
4.	Rest of the species	18.212	9.106	1.518	3.035	1.653	0.759	0.759	-	35.042	14.3
	Total:-	201.248	31.871	2.277	4.553	2.412	1.518	1.518	0.759	246.156	
	%	81.7	13.0	0.9	1.9	1.0	0.6	0.6	0.3	-	100.0
	Basal area (cm^2)	35564	15645	2191	7241	5730	5037	6706	4829	82943	

Crop dia = 21 cms.

Table No.IV.2.13

Distribution of volume per hectare by species and diameter classes in accessible tree forest area.

Forest type : Sal

Area : 142173 ha.

Unit : m^3

S.No.	Species name	DIAMETER CLASSES (in cms) 10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
1.	Acacia catechu	0.014	-	0.041	-	-	-	-	-	0.055	-
2.	Anogeissus latifolia	0.165	0.368	0.204	0.245	-	0.335	1.081	0.561	2.959	1.7
3.	Dalbergia sissoo	0.020	-	-	0.110	-	-	-	-	0.130	0.1
4.	Eucalyptus species	0.002	-	-	-	-	-	-	-	0.002	-
5.	Lannea coromandelica	0.175	0.376	0.345	0.208	-	-	-	-	1.104	0.6
6.	ougeinia dalbergiodes	0.802	1.087	0.477	0.508	-	-	0.338	-	3.212	1.8
7.	Pinus roxburghii	0.136	0.032	0.062	0.484	0.125	-	-	-	0.839	0.5
8.	Shorea robusta	11.570	25.216	31.302	29.736	19.284	8.406	2.511	2.265	130.290	74.3
9.	Syzygium cumini	0.600	1.064	0.658	0.293	0.112	0.171	-	-	2.898	1.7
10.	Terminalia crenulata	0.802	2.713	2.459	4.041	1.894	2.083	0.564	-	14.556	8.3
11.	Rest of the species	9.242	2.973	1.959	1.363	1.298	0.310	0.942	1.171	19.258	11.0
	Total:-	23.528	33.829	37.507	36.988	22.713	11.305	5.436	3.997	175.303	
	%	13.4	19.3	21.4	21.1	13.0	6.4	3.1	2.3		100.0

Table No. IV.2.14

Distribution of stems per hectare by species and diameter classes in accessible tree forest area.

Forest type : Sal
Unit : No. of stems.
Area : 142173 ha.

S.No.	Species name	DIAMETER CLASSES (in cms) 10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
1.	Acacia catechu	0.117	-	0.068	-	-	-	-	-	0.185	0.1
2.	Anogeissus latifolia	1.296	0.930	0.194	0.136	-	0.068	0.125	0.049	2.798	0.8
3.	Dalbergia sissoo	0.068	-	-	0.068	-	-	-	-	0.136	-
4.	Eucalyptus species	0.058	-	-	-	-	-	-	-	0.058	-
5.	Lannea coromandelica	1.553	0.894	0.357	0.117	-	-	-	-	2.921	0.9
6.	Ougeinia dalbergiodes	5.826	2.700	0.580	0.261	-	-	0.049	-	9.416	2.9
7.	Pinus roxburghii	2.124	0.068	0.116	0.354	0.048	-	-	-	2.710	0.8
8.	Shorea robusta	89.795	53.893	29.688	15.460	6.118	1.844	0.395	0.223	197.416	59.5
9.	Syzygium cumini	6.978	3.155	0.828	0.231	0.058	0.068	-	-	11.318	3.4
10.	Terminalia crenulata	3.934	3.944	1.660	1.485	0.452	0.357	0.058	-	11.890	3.6
11.	Rest of the species	72.270	13.956	3.942	1.357	0.705	0.125	0.232	0.173	92.760	28.0
	Total:-	184.019	79.540	37.433	19.469	7.381	2.462	0.859	0.445	331.608	
	%	55.5	24.0	11.3	5.9	2.2	0.7	0.3	0.1	-	100.0
	Basal area (cm^2)	32519	39044	36015	30964	17536	8170	3795	2831	170874	

Crop dia = 26 cms.

Table No. IV.2.15

Distribution of volume per hectare by species and diameter classes in accessible tree forest area.

Forest type : Khair
Area : 14302 ha.
Unit : m^3

S. No.	Species name	DIAMETR CLASSES (in cms) 10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
1.	Acacia catechu	10.073	6.112	3.943	-	-	-	-	-	20.128	55.8
2.	Dalbergia sissoo	3.426	3.392	-	0.910	-	-	-	-	7.728	21.4
3.	Eucalyptus species	-	0.588	0.501	-	-	-	-	-	1.089	3.0
4.	Tectona grandis	0.136	-	-	-	-	-	-	-	0.136	0.4
5.	Rest of the species	3.032	0.919	0.865	0.521	-	1.682	-	-	7.019	19.4
	Total:-	16.667	11.011	5.309	1.431	-	1.682	-	-	36.100	
	%	46.2	30.5	14.7	4.0	-	4.6	-	-	-	100.0

Table No. IV.2. 16

Distribution of stems per hectare by species and diameter classes in accessible tree forest area.

Forest type : Khair

Area : 14302 ha.

Unit : No. of stems.

S.No.	Species name	DIAMETER CLASSES (in cms) 10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
1.	Acacia catechu	143.972	21.594	6.165	-	-	-	-	-	171.731	74.8
2.	Dalbergia sissoo	16.251	6.725	-	0.560	-	-	-	-	23.536	10.3
3.	Eucalyptus species	-	1.121	0.560	-	-	-	-	-	1.681	0.7
4.	Tectona grandis	1.120	-	-	-	-	-	-	-	1.120	0.5
5.	Rest of the species	23.537	5.044	1.681	0.560	-	0.560	-	-	31.382	13.7
	Total:-	184.880	34.484	8.406	1.120	-	0.560	-	-	229.450	
	%	80.6	15.0	3.7	0.5	-	0.2	-	-	-	100.0
	Basal area (cm^2)	32671	16927	13369	1781	-	1330	-	-	66078	

Crop dia = 19 cms.

Table No. IV.2.17

Distribution of volume per hectare by species and diameter classses in accessible tree forest area.

Forest type : Miscellaneous
Area : 285593 ha.
Unit : m^3

S. No.	Species Name	DIAMETER CLASSES (in cms) 10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
1.	Acacia catechu	0.212	0.472	0.408	0.248	0.059	-	-	-	1.399	1.4
2.	Anogeissus latifolia	0.236	0.800	1.444	1.573	1.267	0.437	0.236	-	5.993	6.2
3.	Dalbergia sissoo	0.724	1.007	0.541	0.546	0.261	-	-	-	3.079	3.2
4.	Eucalyptus species	1.301	0.174	0.019	-	-	-	-	-	1.494	1.5
5.	Lannea coromandelica	0.455	1.279	1.527	0.775	0.498	-	-	-	4.534	4.7
6.	Lyonia ovalifolia	0.091	0.047	0.044	-	-	-	-	-	0.182	0.2
7.	Ougeinia dalbergiodes	0.700	0.843	0.691	0.353	0.083	-	-	-	2.670	2.8
8.	Pinus roxburghii	0.011	0.053	0.166	0.302	0.241	0.102	0.147	-	1.022	1.1
9.	Quercus incana	0.280	0.125	0.120	0.110	0.089	-	-	-	0.724	0.7
10.	Rhododendron arboreum	0.099	0.130	0.010	-	-	-	-	-	0.239	0.2
11.	Shorea robusta	0.891	2.613	3.865	4.021	3.366	1.650	0.851	0.295	17.552	18.1
12.	Syzygium cumini	0.264	0.810	1.235	0.654	0.173	0.192	0.195	-	3.523	3.7
13.	Tectona grandis	0.025	-	-	-	-	-	-	-	0.025	-
14.	Terminalia crenulata	0.246	0.738	2.083	3.322	2.533	1.087	0.294	1.432	11.735	12.1
15.	Rest of the species	13.706	5.338	5.015	3.506	1.921	2.039	2.580	8.571	42.676	44.1
	Total:-	19.241	14.429	17.168	15.410	10.491	5.507	4.303	10.298	96.847	-
	%	19.9	14.9	17.7	15.9	10.8	5.7	4.4	10.7	-	100.0

Table No. IV.2.18

Distribution of stems per hectare by species and diameter classes in accessible tree forest area.

Forest type : Miscellaneous
Area : 285593 ha.
Unit : No. of stems.

S.No.	Species name	DIAMETER CLASSES (in cms) 10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
1.	Acacia catechu	2.905	1.396	0.583	0.198	0.029	-	-	-	5.111	2.0
2.	Anogeissus latifolia	1.838	1.789	1.290	0.775	0.379	0.088	0.036	-	6.195	2.5
3.	Dalbergia sissoo	4.035	1.898	0.531	0.290	0.090	-	-	-	6.844	2.7
4.	Eucalyptus species	21.092	0.586	0.029	-	-	-	-	-	21.707	8.7
5.	Lannea coromandelica	4.193	2.779	1.568	0.465	0.197	-	-	-	9.202	3.7
6.	Ougeinia dalbergiodes	4.987	2.149	0.727	0.220	0.036	-	-	-	8.119	3.2
7.	Lyonia ovalifolia	1.661	0.311	0.100	-	-	-	-	-	2.072	0.8
8.	Shorea robusta	6.817	5.410	3.646	2.083	1.085	0.347	0.134	0.029	19.551	7.8
9.	Pinus roxburghii	0.212	0.186	0.230	0.222	0.111	0.033	0.029	-	1.023	0.4
10.	Quercus incana	4.638	0.508	0.232	0.119	0.059	-	-	-	5.556	2.2
11.	Rhododendron arboreum	1.622	0.793	0.033	-	-	-	-	-	2.448	1.0
12.	Syzygium cumini	3.052	2.112	1.583	0.504	0.088	0.071	0.056	-	7.466	3.0
13.	Tectona grandis	0.225	-	-	-	-	-	-	-	0.225	0.1
14.	Terminalia crenulata	1.327	1.025	1.323	1.249	0.583	0.166	0.036	0.082	5.791	2.3
15.	Rest of the species	107.714	25.524	9.805	3.410	1.044	0.748	0.647	0.690	149.582	59.6
	Total:-	166.318	46.466	21.680	9.535	3.701	1.453	0.938	0.801	250.892	
	%	66.3	18.5	8.6	3.8	1.5	0.6	0.4	0.3	-	100.0
	Basal area (cm^2)	29391	22809	20859	15165	8793	4822	4144	5096	111079	

Crop dia = 24 cms.

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Table No.IV.2.19

Distribution of stems per hectare by species and diameter classes in accessible tree forest area

Stratum - Almora

Area of stratum : 221734 ha.
No.of sample plots : 233
Unit : No. of stems

Species	DIAMETER CLASSES (in cms)									
	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
Abies pindrow	0.259	0.189	0.153	-	0.103	-	-	-	0.703	0.27
Anogeissus latifolia	-	-	-	0.043	-	-	-	-	0.043	0.02
Lannea coromandelica	0.489	0.179	0.086	-	-	-	-	-	0.754	0.29
Pieris ovalifolia	13.403	4.348	1.532	0.318	0.156	0.053	-	0.053	19.864	7.73
Ougeinia dalbergiodes	0.099	-	0.043	-	-	-	-	-	0.143	0.06
Pinus roxburghii	44.053	27.652	19.070	9.927	5.172	1.595	0.221	0.089	107.778	41.96
Quercus dilatata	0.954	0.583	0.583	0.318	0.212	0.212	-	0.106	2.971	1.16
Quercus incana	21.912	5.193	2.066	0.756	0.414	0.106	0.103	0.103	30.654	11.93
Quercus semicarpifolia	2.596	1.857	0.955	0.371	0.584	0.212	0.212	0.265	7.052	2.74
Rhododendron arboreum	17.498	5.397	1.843	0.924	0.574	0.159	-	0.106	26.501	10.32
Shorea robusta	4.238	2.006	0.653	0.172	-	-	0.043	-	7.112	2.77
Syzygium cumini	0.534	0.088	-	-	-	-	-	-	0.622	0.24
Terminalia crenulata	-	0.099	-	0.043	-	-	-	-	0.143	0.05
Rest of species	39.736	8.305	2.274	1.012	0.265	0.361	0.544	0.053	52.550	20.46
Total	145.771	55.897	29.258	13.886	7.480	2.699	1.123	0.775	256.889	
%	56.75	21.76	11.39	5.40	2.91	1.05	0.44	0.30		100

Table No.IV.2.20

Distribution of volume per hectare by species and diameter classes in accessible tree forest area.

Stratum: Almora

Area of stratum : 221734 ha.
No. of sample plots : 233
Unit : m^3

Species	DIAMETER CLASSES (in cms)									
	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
Abies pindrow	0.065	0.072	0.133	-	0.242	-	-	-	0.512	0.53
Anogeissus latifolia	-	-	-	0.103	-	-	-	-	0.103	0.10
Lannea coromandelica	0.050	0.075	0.101	-	-	-	-	-	0.225	0.23
Pieris ovalifolia	0.624	0.789	0.629	0.221	0.167	0.082	-	0.146	2.658	2.79
Ougeinia dalbergiodes	0.007	-	0.037	-	-	-	-	-	0.044	0.04
Pinus roxburghii	2.744	8.327	13.759	13.233	11.393	5.236	1.023	0.521	56.236	59.12
Quercus dilatata	0.076	0.151	0.317	0.321	0.382	0.577	-	0.589	2.412	2.53
Quercus incana	1.456	1.136	1.004	0.745	0.639	0.234	0.313	0.497	6.023	6.33
Quercus semicarpifolia	0.268	0.575	0.612	0.527	1.083	0.658	0.800	2.268	6.790	7.14
Rhododendron arboreum	0.969	0.937	0.718	0.602	0.545	0.248	-	0.245	4.263	4.48
Shorea robusta	0.472	0.886	0.671	0.309	-	-	0.252	-	2.590	2.72
Syzygium cumini	0.041	0.030	-	-	-	-	-	-	0.071	0.07
Terminalia crenulata	-	0.060	-	0.147	-	-	-	-	0.256	0.26
Rest of species	5.039	1.695	1.230	1.109	0.441	0.984	2.185	0.310	12.994	13.66
Total	11.809	14.733	19.211	17.316	14.892	8.019	4.573	4.576	95.128	
%	12.41	15.49	20.20	18.20	15.65	8.43	4.81	4.81		100

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Table No.IV.2.21

Distribution of stems per hectare by species and diameter classes in accessible tree forest area.

Stratum: Chamoli

Area of stratum : 98480 ha.
No.of sample plots : 105
Unit : No. of stems

Species	DIAMETER CLASSES (in cms)									
	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
Abies pindrow	0.476	0.190	0.891	0.689	-	0.095	-	-	2.341	0.67
Pieris ovaliflora	34.760	10.086	2.987	1.807	0.531	0.213	-	0.106	50.490	14.50
Pinus roxburghii	15.763	7.971	-	3.613	2.862	0.330	0.353	-	35.524	10.20
Quercus dilatata	12.838	2.199	0.521	0.213	0.531	0.319	0.106	0.213	16.939	4.86
Quercus incana	57.160	13. 655	4.442	3.060	1.807	1.063	0.638	0.106	81.930	23.52
Quercus semicarpifolia	15.048	8.139	5.281	1.902	0.957	0.531	0.425	-	32.283	9.27
Rhododendron arboreum	56.694	17.980	7.535	2.976	1.606	0.543	0.224	-	87.556	25.14
Syzygium cumini	0.106	-	-	-	-	-	-	-	0.106	0.03
Rest of species	31.199	6.355	2.719	0.543	-	0.213	-	0.095	41.123	11.81
Total:	224.043	66.576	29.007	14.802	8.293	3.306	1.746	0.520	348.293	
%	64.33	19.11	8.33	4.25	2.38	0.95	0.50	0.15		100

Table No.IV.2.22

Distribution of volume per hectare by species and diameter classes in accessible tree forest area.

Stratum: Chamoli

Area of stratum : 98480 ha.
No. of sample plots : 105
Unit : m^3

Species	DIAMETER CLASSES (in cms)									
	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
Abies pindrow	0.130	0.111	0.783	0.945	-	0.288	-	-	2.258	2.42
Pieris ovalifolia	1.824	1.917	1.230	1.377	0.589	0.377	-	0.339	7.654	8.19
Pinus roxburghii	0.964	2.404	3.195	4.818	6.859	1.027	1.502	-	20.768	22.23
Quercus dilatata	0.856	0.503	0.293	0.287	1.071	1.017	0.389	1.406	5.822	6.23
Quercus incana	3.419	3.127	2.325	2.945	2.799	2.412	2.093	0.633	19.754	21.14
Quercus semicarpifolia	1.312	2.507	3.483	2.325	1.857	1.578	1.687	-	14.748	15.79
Rhododendron arboreum	2.980	3.187	2.796	2.033	1.638	0.812	0.456	-	13.902	14.88
Syzygium cumini	0.005	-	-	-	-	-	-	-	0.005	-
Rest of species	3.996	1.313	1.442	0.595	-	0.615	-	0.557	8.518	9.12
tal:	15.488	15.069	15.546	15.325	14.814	8.125	6.127	2.936	93.430	
%	16.58	16.13	16.64	16.40	15.85	8.70	6.56	3.14		100

Table No. IV.2.23

Distribution of stems per hectare by species and diameter classes in accessible tree forest area

Stratum: Dehradun

Area of stratum : 76786 ha.
No. of sample plots : 111
Unit : No. of stems

Species	DIAMETER CLASSES (in cms)									
	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
Acacia catechu	2.304	0.527	0.105	-	-	-	-	-	2.936	0.92
Anogeissus latifolia	0.880	1.274	0.316	0.105	0.105	-	-	0.092	2.773	0.87
Dalbergia sissoo	2.528	0.316	0.105	0.421	-	-	-	-	3.371	1.06
Eucalyptus species	0.632	0.211	-	-	-	-	-	-	0.843	0.26
Lannea coromandelica	2.548	1.774	0.197	0.092	0.105	-	-	-	4.716	1.48
Pieris ovalifolia	0.118	0.118	-	-	-	-	-	-	0.236	0.07
Ougeinia dalbergiodes	3.017	2.049	0.183	-	-	-	0.092	-	5.341	1.68
Pinus roxburghii	-	-	0.118	-	-	-	-	-	0.118	0.04
Quercus dilatata	0.590	-	-	-	-	-	-	-	0.590	0.19
Quercus incana	3.067	0.354	0.118	-	-	-	-	-	3.539	1.11
Shorea robusta	83.347	48.903	21.278	9.242	4.050	0.826	0.183	0.183	168.012	52.77
Syzygium cumini	3.605	1.206	0.318	-	0.105	-	-	-	5.297	1.66
Terminalia crenulata	2.270	2.834	1.749	0.656	0.408	0.092	-	-	8.005	2.52
Rest of species	90.303	15.401	4.049	1.645	0.486	0.105	0.408	0.211	112.607	35.37
Total:	195.209	74.965	28.597	12.161	5.260	1.023	0.683	0.486	318.384	
%	61.31	23.55	8.98	3.82	1.65	0.32	0.22	0.15		100

Table No.IV.2.24

Distribution of volume per hectare by species and diameter classes in accessible tree forest area.

Stratum: Dehradun

Area of stratum : 76786 ha.
No. of sample plots : 111
Unit : m^3

Species	DIAMETER CLASSES (in cms.) 10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
Acacia catechu	0.159	0.167	0.087	-	-	-	-	-	0.413	0.31
Anogeissus latifolia	0.118	0.449	0.272	0.167	0.323	-	-	1.057	2.387	1.78
Dalbergia sissoo	0.483	0.129	0.129	0.830	-	-	-	-	1.571	1.17
Eucalyptus species	0.036	0.054	-	-	-	-	-	-	0.089	0.07
Lannea coromandelica	0.276	0.724	0.200	0.150	0.295	-	-	-	1.645	1.23
Pieris ovalifolia	0.003	0.015	-	-	-	-	-	-	0.018	0.01
Ougeinia dalbergiodes	0.385	0.788	0.143	-	-	-	0.638	-	1.953	1.46
Pinus roxburghii	-	-	0.061	-	-	-	-	-	0.061	0.05
Quercus dilatata	0.047	-	-	-	-	-	-	-	0.048	0.03
Quercus incana	0.215	0.089	0.065	-	-	-	-	-	0.368	0.27
Shorea robusta	10.785	22.797	22.568	17.242	12.885	3.792	1.246	1.741	93.056	69.48
Syzygium cumini	0.284	0.459	0.270	-	0.191	-	-	-	1.205	0.90
Terminalia crenulata	0.383	2.047	2.484	1.757	1.729	0.510	-	-	8.911	6.65
Rest of species	11.575	3.246	1.857	1.701	0.826	0.316	1.628	1.072	22.215	16.59
tal:	24.794	30.962	28.129	21.847	16.248	4.618	3.512	3.871	133.938	
%	18.51	23.10	21.00	16.31	12.13	3.44	2.62	2.89		100

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Table No.IV.2.5

Distribution of stems per hectare by species and diameter classes in accessible tree forest area

Stratum: Garhwal

Area of stratum : 158602 ha.
No. of sample plots : 168
Unit : No. of stems

Species	DIAMETER CLASSES (in cms.)									
	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
Abies pindrow	1.085	0.477	0.719	0.243	0.238	0.357	0.243	0.243	3.605	1.29
Acacia catechu	1.085	0.704	0.253	0.256	-	-	-	-	2.299	0.82
Anogeissus latifolia	2.452	1.969	1.018	1.019	0.320	0.061	0.125	-	6.965	2.49
Cedrus deodara	0.119	-	0.179	0.119	0.238	-	-	-	0.655	0.23
Dalbergia sissoo	0.317	0.256	-	0.061	-	-	-	-	0.634	0.23
Eucalyptus species	4.610	0.356	-	-	-	-	-	-	4.867	1.74
Lannea coromandelica	2.353	1.722	1.402	0.381	0.064	-	-	-	5.925	2.12
Pieris ovalifolia	7.546	2.069	0.895	0.257	-	-	-	-	10.767	3.84
Ougeinia dalbergiodes	6.498	2.745	0.884	0.439	0.064	-	-	-	10.629	3.79
Pinus roxburghii	4.871	1.601	1.563	0.537	0.655	0.298	0.060	-	9.585	3.42
Quercus dilatata	6.211	0.816	0.387	0.252	0.243	0.257	0.252	0.179	8.593	3.07
Quercus incana	11.029	3.877	2.033	1.000	0.257	0.060	0.307	0.386	18.948	6.76
Quercus semicarpifolia	1.712	1.514	0.959	0.752	0.674	0.248	0.064	0.064	5.988	2.14
Rhododendron arboreum	15.559	5.291	1.208	0.252	0.193	-	-	-	22.503	8.03
Shorea robusta	18.478	12.112	9.067	4.576	1.902	0.548	0.189	0.061	46.932	16.76
Syzygium cumini	3.766	1.415	0.634	0.125	-	0.189	-	-	6.129	2.19
Tectona grandis	1.263	-	-	-	-	-	-	-	1.263	0.45
Terminalia crenulata	1.358	0.938	1.201	1.258	0.317	0.314	0.064	-	5.450	1.94
Rest of species	78.399	18.641	6.756	2.600	0.879	0.445	0.253	0.385	108.358	38.69
Total:	168.714	56.404	29.151	14.128	6.044	2.775	1.557	1.317	280.092	
%	60.24	20.14	10.41	5.04	2.16	0.99	0.55	0.47		100

Table IV.2.26

Distribution of volume per hectare by species and diameter classes in accessible tree forest area.

Stratum: Garhwal

Area of stratum : 158602 ha.
No. of sample plots: 168
Unit : m^3

Species	DIAMETER CLASSES (in cms.)									
	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
Abies pindrow	0.299	0.228	0.572	0.328	0.563	1.191	1.084	1.470	5.736	4.60
Acacia catechu	0.102	0.234	0.165	0.300	-	-	-	-	0.802	0.64
Anogeissus latifolia	0.307	0.907	1.141	2.060	1.095	0.301	0.950	-	6.761	5.43
Cedrus deodara	0.030	-	0.223	0.225	0.619	-	-	-	1.096	0.88
Dalbergia sissoo	0.078	0.115	-	0.099	-	-	-	-	0.292	0.23
Eucalyptus species	0.275	0.088	-	-	-	-	-	-	0.362	0.29
Lannea coromandelica	0.279	0.829	1.374	0.631	0.179	-	-	-	3.292	2.64
Pieris ovalifolia	0.381	0.387	0.330	0.181	-	-	-	-	1.279	1.03
Ougeinia dalbergiodes	0.889	1.064	0.810	0.770	0.149	-	-	-	3.681	2.95
Pinus roxburghii	0.291	0.482	1.128	0.649	1.422	0.890	0.267	-	5.128	4.11
Quercus dilatata	0.410	0.194	0.208	0.309	0.441	0.766	1.078	1.112	4.517	3.62
Quercus incana	0.709	0.879	1.082	0.975	0.391	0.119	0.947	2.122	7.223	5.80
Quercus semicarpifolia	0.139	0.483	0.656	0.947	1.312	0.742	0.244	0.331	4.855	3.90
Rhododendron arboreum	0.821	0.925	0.448	0.158	0.188	-	-	-	2.540	2.04
Shorea robusta	2.350	5.857	9.617	8.920	5.916	2.546	1.155	0.537	36.897	29.62
Syzygium cumini	0.318	0.488	0.535	0.143	-	0.500	-	-	1.984	1.59
Tectona grandis	0.102	-	-	-	-	-	-	-	0.102	0.08
Terminalia cremulata	0.292	0.621	1.987	3.389	1.368	1.985	0.529	-	10.170	8.16
Rest of species	9.985	3.934	3.454	2.657	1.626	1.144	1.030	4.063	27.894	22.39
Total:	18.055	17.715	23.730	22.740	15.269	10.184	7.284	9.634	124.610	
%	14.49	14.22	19.04	18.25	12.25	8.17	5.85	7.73		100

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Table No. IV.2.27

Distribution of stems per hectare by species and diameter classes in accessible tree forest area

Stratum: Nainital

Area of stratum : 250051 ha.
No. of sample plots : 312
Unit : No. of stems

Species	DIAMETER CLASSES (in cms.)									
	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
Acacia catechu	9.959	2.219	0.902	0.034	0.034	-	-	-	13.149	4.99
Anogeissus latifolia	0.511	0.543	0.613	0.171	0.102	0.068	0.033	-	2.039	0.77
Dalbergia sissoo	4.613	2.295	0.545	0.237	0.102	-	-	-	7.792	2.96
Eucalyptus species	22.963	0.635	0.066	-	-	-	-	-	23.665	8.99
Lannea coromandelica	0.986	0.923	0.814	0.171	0.034	-	-	-	2.929	1.11
Pieris ovalifolia	2.928	0.575	0.076	-	-	-	-	-	3.580	1.36
Ougeinia dalbergiodes	2.694	0.944	0.342	0.033	-	-	-	-	4.014	1.52
Pinus roxburghii	6.064	4.127	2.340	1.500	0.230	0.117	0.034	-	14.412	5.47
Quercus dilatata	0.917	0.612	0.153	0.038	-	-	0.038	-	1.758	0.67
Quercus incana	7.818	3.605	2.256	0.922	0.461	0.038	0.038	0.076	15.215	5.78
Rhododendron arboreum	5.426	3.630	1.225	0.306	0.115	0.115	0.038	-	10.856	4.12
Shorea robusta	14.039	9.969	7.188	4.437	2.177	0.770	0.197	0.099	38.876	14.77
Syzygium cumini	3.429	2.740	1.469	0.342	0.101	-	0.034	-	8.115	3.08
Tectona grandis	5.297	0.833	0.032	0.064	-	0.032	-	-	6.258	2.38
Terminalia crenulata	1.625	1.655	0.913	0.975	0.615	0.205	0.033	0.072	6.092	2.31
Rest of species	73.602	19.277	7.016	2.103	0.954	0.647	0.443	0.511	104.552	39.72
Total:	162.870	54.538	25.953	11.332	4.926	1.991	0.888	0.759	263.301	
%	61.86	20.72	9.86	4.30	1.87	0.76	0.34	0.29		100

Table No.IV.2.28

Distribution of volume per hectare by species and diameter classes in accessible tree forest area.

Stratum: Nainital

Area of stratum : 250051 ha.
No. of sample plots 312
Unit : m^3

Species	DIAMETER CLASSES (in cms.)									
	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
Acacia catechu	0.700	0.685	0.610	0.050	0.067	-	-	-	2.112	1.97
Anogeissus latifolia	0.069	0.257	0.704	0.376	0.334	0.338	0.282	-	2.358	2.19
Dalbergia sissoo	0.839	1.232	0.554	0.425	0.297	-	-	-	3.347	3.11
Eucalyptus species	1.455	0.197	0.051	-	-	-	-	-	1.702	1.58
Lannea coromandelica	0.131	0.458	0.762	0.310	0.078	-	-	-	1.740	1.62
Pieris ovalifolia	0.137	0.108	0.032	-	-	-	-	-	0.277	0.26
Ougeinia dalbergiodes	0.392	0.369	0.323	0.059	-	-	-	-	1.143	1.06
Pinus roxburghii	0.393	1.245	1.760	2.093	0.507	0.391	0.168	-	6.557	6.10
Quercus dilatata	0.078	0.153	0.074	0.040	-	-	0.156	-	0.500	0.47
Quercus incana	0.509	0.853	1.172	0.846	0.700	0.099	0.118	0.361	4.656	4.33
Rhododendron arboreum	0.321	0.655	0.453	0.190	0.107	0.167	0.067	-	1.960	1.82
Shorea robusta	1.923	4.722	7.592	8.649	6.786	3.514	1.305	1.143	35.634	33.14
Syzygium cumini	0.301	1.010	1.161	0.432	0.204	-	0.119	-	3.228	3.00
Tectona grandis	0.608	0.356	0.034	0.148	-	0.157	-	-	1.303	1.21
Terminalia crenulata	0.327	1.196	1.357	2.537	2.584	1.274	0.321	0.878	10.473	9.74
Rest of species	9.367	3.977	3.644	2.152	1.809	1.763	1.803	6.015	30.530	28.40
Total:	17.549	17.471	20.282	18.306	13.474	7.702	4.339	8.398	107.521	
%	16.32	16.25	18.86	17.03	12.53	7.16	4.04	7.81		100

Contents

Table No.IV.2.29

Distribution of stems per hectare by species and diameter classes in accessible tree forest area

Stratum: Pithoragarh

Area of stratum : 157134 ha.
No. of sample plots : 232
Unit : No. of stems

Species	DIAMETER CLASSES (in cms.)									
	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
Abies pindrow	0.248	0.046	0.099	-	-	0.046	-	-	0.441	0.19
Acacia catechu	0.396	0.129	-	0.047	-	-	-	-	0.572	0.25
Anogeissus latifolia	0.189	-	-	0.094	0.047	-	-	-	0.330	0.14
Cedrus deodara	0.043	0.086	0.301	0.086	-	-	-	-	0.517	0.22
Dalbergia sissoo	-	-	0.047	-	-	-	-	-	0.047	0.02
Lannea coromandelica	1.981	1.135	0.141	0.094	0.189	-	-	-	3.540	1.54
Pieris ovalifolia	11.780	2.372	1.070	0.323	0.046	0.139	-	-	15.729	6.83
Ougeinia dalbergiodes	3.071	1.268	0.322	0. 142	0.047	-	-	-	4.850	2.11
Pinus roxburghii	8.182	9.150	7.158	4.789	2.826	0.477	0.047	0.047	32.676	14.20
Quercus dilatata	0.323	0.092	0.231	0.046	0.139	0.092	0.046	0.139	1.108	0.48
Quercus incana	13.503	5.139	3.722	2.132	1.113	0.554	0.277	0.693	27.133	11.79
Quercus semicarpifolia	1.983	0.753	0.416	0.604	0.323	0.277	0.238	0.377	4.970	2.16
Rhododendron arboreum	11.051	4.776	2.052	1.062	0.416	0.231	0.092	0.139	19.817	8.61
Shorea robusta	9.399	4.516	2.236	1.527	0.361	0.185	-	-	18.223	7.92
Syzygium cumini	2.620	1.612	0.974	0.702	0.047	-	0.047	-	6.003	2.61
Terminalia crenulata	0.977	0.188	0.369	0.365	0.043	-	-	0.094	2.037	0.89
Rest of species	67.478	14.318	5.425	2.614	1.216	0.421	0.140	0.557	92.168	40.04
Total:	133.221	45.583	24.565	14.628	6.813	2.422	0.888	2.045	230.163	
%	57.88	19.80	10.67	6.36	2.96	1.05	0.39	0.89		100

Table No.IV.2.30

Distribution of volume per hectare by species and diameter classes in accessible tree forest area

Stratum: Pithoragarh

Area of stratum : 157134 ha.
No. of sample plots : 232
Unit : m^3

Species	DIAMETER CLASSES (in cms.) 10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
Abies pindrow	0.066	0.018	0.096	-	-	0.161	-	-	0.341	0.33
Acacia catechu	0.029	0.037	-	0.069	-	-	-	-	0.135	0.13
Anogeissus latifolia	0.024	-	-	0.204	0.166	-	-	-	0.395	0.39
Cedrus deodara	0.010	0.054	0.302	0.137	-	-	-	-	0.503	0.49
Dalbergia sissoo	-	-	0.042	-	-	-	-	-	0.042	0.04
Lannea coromandelica	0.185	0.471	0.145	0.151	0.459	-	-	-	1.412	1.38
Pieris ovalifolia	0.583	0.443	0.439	0.227	0.060	0.220	-	-	1.971	1.93
Ougeinia dalbergiodes	0.406	0.527	0.290	0.230	0.110	-	-	-	1.562	1.53
Pinus roxburghii	0.616	2.813	5.176	6.391	6.109	1.466	0.192	0.262	23.026	22.50
Quercus dilatata	0.018	0.023	0.133	0.051	0.237	0.281	0.169	1.270	2.182	2.13
Quercus incana	0.887	1.210	2.018	2.127	1.788	1.266	0.909	3.785	13.989	13.67
Quercus semicarpifolia	0.133	0.212	0.261	0.822	0.664	0.788	0.938	3.025	6.842	6.69
Rhododendron arboreum	0.639	0.882	0.770	0.677	0.410	0.335	0.185	0.348	4.245	4.15
Shorea robusta	1.190	2.061	2.286	2.957	1.161	0.911	-	-	10.546	10.30
Syzygium cumini	0.243	0.598	0.711	0.957	0.085	-	0.164	-	2.759	2.70
Terminalia crenulata	0.145	0.122	0.526	1.041	0.198	-	-	1.996	4.027	3.93
Rest of species	8.536	2.997	2.685	2.726	2.317	1.122	0.574	7.400	28.357	2.77
Total:	13.709	12.469	15.859	18.767	13.765	6.549	3.131	18.085	102.339	
%	13.40	12.18	15.50	18.34	13.45	6.40	3.06	17.67		100

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Table No.IV.2.31

Distribution of stems per hectare by species and diameter classes in accessible tree forest area

Stratum: Tehri

Area of stratum : 22945 ha.
No. of sample plots: 36
Unit : No. of stems

Species	DIAMETER CLASSES (in cms.)									
	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
Acacia catechu	0.714	-	-	-	-	-	-	-	0.714	0.26
Anogeissus latifolia	4.206	4.762	2.500	1.071	0.714	0.357	-	-	13.611	4.88
Lannea coromandelica	14.625	4.900	0.714	1.071	-	-	-	-	21.332	7.65
Pieris ovalifolia	-	0.617	-	-	-	-	-	-	0.617	0.22
Ougeinia dalbergiodes	0.714	0.357	-	-	-	-	-	-	1.071	0.38
Pinus roxburghii	0.370	-	0.726	0.309	-	-	-	-	1.404	0.50
Quercus dilatata	2.469	1.852	0.617	0.309	-	-	0.617	-	5.865	2.10
Quercus incana	67.105	32.657	4.169	1.852	0.926	0.309	-	0309	107.226	38.45
Rhododendron arboreum	0.617	1.234	-	-	-	-	-	-	1.852	0.67
Shorea robusta	4.919	4.483	0.714	-	0.357	-	-	-	10.473	3.76
Syzygium cumini	1.544	-	-	-	-	-	-	-	1.543	0.55
Terminalia crenulata	6.787	2.500	1.480	0.357	0.357	-	-	-	11.382	4.08
Rest of species	79.007	15.587	3.990	1.409	0.357	-	0.357	1.071	101.777	36.50
Total:	183.099	68.849	14.808	6.378	2.712	0.666	0.974	1.380	278.867	
%	65.66	24.69	5.31	2.29	0.97	0.24	0.35	0.49		100

Table No.IV.2.32

Distribution of volume per hectare by species and diameter classes in accessible tree forest area

Stratum: Tehri

Area of stratum : 22945 ha.
No. of sample plots 36
Unit : m^3

Species	DIAMETER CLASSES (in cms.)									
	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
Acacia catechu	0.030	-	-	-	-	-	-	-	0.030	0.04
Anogeissus latifolia	0.536	1.861	2.786	1.887	2.360	1.765	-	-	11.295	13.83
Lannea coromandelica	1.411	1.909	0.710	1.672	-	-	-	-	5.702	6.98
Pieris ovalifolia	-	0.133	-	-	-	-	-	-	0.133	0.16
Ougeinia dalbergiodes	0.061	0.110	-	-	-	-	-	-	0.170	0.21
Pinus roxburghii	0.008	-	0.507	0.327	-	-	-	-	0.843	1.03
Quercus dilatata	0.215	0.491	0.405	0.451	-	-	2.604	-	4.167	5.10
Quercus incana	5.139	6.986	1.944	1.715	1.349	0.862	-	1.394	19.387	23.74
Rhododendron arboreum	0.043	0.227	-	-	-	-	-	-	0.271	0.33
Shorea robusta	0.623	2.187	0.803	-	1.070	-	-	-	4.684	5.74
Syzygium cumini	0.135	-	-	-	-	-	-	-	0.135	0.17
Terminalia crenulata	1.336	1.471	2.426	1.001	1.708	-	-	-	7.944	9.73
Rest of species	10.106	3.305	1.920	1.290	0.529	-	1.239	8.511	26.900	32.94
tal:	19.643	18.780	11.502	8.344	7.016	2.627	3.844	9.905	81.660	
%	24.05	23.00	14.09	10.22	8.59	3.22	4.70	12.13		100

Table No. IV.2.33

Distribution of total volume by species and diameter in accessible tree forest area

Total area : 983397 ha.

Unit : ,000 m^3

Species name	DIAMETER CLASSES (in cms)									
	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
Abies pindrow	84.912	65.791	212.309	145.204	142.830	242.562	171.978	233.109	1298.695	1.2
Acacia catechu	208.387	226.827	185.300	70.893	16.732	-	-	-	708.139	0.7
Anogeissus latifolia	90.904	286.869	488.610	483.992	361.887	172.619	221.145	79.729	2185.755	2.1
Cedrus deodara	6.315	8.454	82.778	57.197	98.131	-	-	-	252.875	0.2
Dalbergia sissoo	258.602	336.034	154.728	184.504	74.374	-	-	-	1008.242	0.9
Eucalyptus species	409.999	67.168	12.586	-	-	-	-	-	489.753	0.5
Lannea coromandelica	170.453	435.101	484.975	250.918	142.275	-	-	-	1483.722	1.4
Ougeinia dalbergiodes	334.865	405.657	273.559	173.020	40.917	-	48.074	-	1276.092	1.2
Lyonia ovalifolia	503.895	524.929	389.428	248.774	104.365	89.914	-	65.542	1926.847	1.8
Pinus roxburghii	941.861	2905.141	4800.770	5034.231	4503.051	1726.410	488.395	156.318	20556.177	19.5
Quercus dilatata	197.090	166.719	180.493	176.327	297.004	393.083	334.379	644.414	2389.509	2.3
Quercus semicarpifolia	231.324	483.618	623.109	624.553	734.499	542.251	528.752	1028.488	4796.594	4.6
Quercus incana	1171.239	1268.146	1281.680	1194.193	965.776	551.515	597.760	1225.573	8255.882	7.9
Rhododendron arboreum	819.175	975.172	738.936	512.069	402.765	229.076	90.699	108.663	3876.555	3.7
Shorea robusta	1972.262	4398.267	5648.223	5410.130	3813.696	1711.388	659.063	502.300	24115.329	23.0
Syzygium cumini	197.918	465.370	507.514	281.054	78.774	79.303	55.586	-	1665.519	1.6
Tectona grandis	168.138	88.879	8.434	37.124	-	39.333	-	-	341.908	0.3
Terminalia crenulata	210.139	617.945	979.960	1523.295	1063.866	671.841	164.018	533.219	5764.283	5.5
Rest of the Spp.	7878.554	2913.562	2478.316	1849.259	1245.830	1100.136	1338.162	3714.822	22518.641	21.5
Total:-	15856.032	16639.649	19531.708	18256.737	14086.772	7549.431	4698.011	8292.177	104910.517	-
%	15.1	15.9	18.6	17.4	13.4	7.2	4.5	7.9	-	100.0

Table No. IV.2..34

Distribution of volume per hectare by species and diameter cl-ass in accessible tree forest area

Total area : 983397 ha.

Unit : m^3

S. No.	Species name	DIAMETER CLASSES (in cms) 10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
1.	Abies pindrow	0.086	0.067	0.216	0.148	0.145	0.247	0.175	0.237	1.321	1.2
2.	Acacia catechu	0.211	0.231	0.189	0.072	0.017	-	-	-	0.720	0.7
3.	Anogeissus latifolia	0.092	0.292	0.497	0.492	0.368	0.176	0.225	0.081	2.223	2.1
4.	Cedrus deodara	0.006	0.008	0.085	0.058	0.100	-	-	-	0.257	0.2
5.	Dalbergia sissoo	0.262	0.342	0.158	0.188	0.075	-	-	-	1.025	1.0
6.	Eucalyptus species	0.417	0.068	0.013	-	-	-	-	-	0.498	0.5
7.	Lannea coromandelica	0.173	0.443	0.493	0.255	0.145	-	-	-	1.509	1.4
8.	Ougeinia dalbergiodes	0.340	0.413	0.278	0.176	0.042	-	0.049	-	1.298	1.2
9.	Lyonia ovalifolia	0.512	0.534	0.396	0.253	0.106	0.091	-	0.067	1.959	1.8
10.	Pinus roxburghii	0.958	2.954	4.882	5.119	4.579	1.755	0.497	0.159	20.903	19.6
11.	Quercus dilatata	0.201	0.169	0.184	0.179	0.302	0.400	0.340	0.655	2.430	2.3
12.	Quercus incana	1.191	1.289	1.304	1.214	0.982	0.561	0.608	1.246	8.395	7.9
13.	Quercus semicarpifolia	0.235	0.492	0.634	0.635	0.747	0.551	0.538	1.046	4.878	4.5
14.	Rhododendron arboreum	0.833	0.992	0.751	0.521	0.410	0.233	0.092	0.110	3.942	3.7
15.	Shorea robusta	2.006	4.473	5.743	5.501	3.878	1.740	0.670	0.511	24.522	23.0
16.	Syzygium cumini	0.201	0.473	0.516	0.286	0.080	0.081	0.057	-	1.694	1.6
17.	Tectona grandis	0.171	0.090	0.009	0.038	-	0.040	-	-	0.348	0.3
18.	Terminalia crenulata	0.214	0.628	0.997	1.549	1.082	0.683	0.167	0.542	5.862	5.5
19.	Rest of the species	8.011	2.963	2.520	1.880	1.267	1.119	1.361	3.777	22.898	21.5
	Total:-	16.120	16.921	19.865	18.564	14.325	7.677	4.779	8.431	106.682	-
	%	15.1	15.9	18.6	17.4	13.4	7.2	4.5	7.9	-	100.0

Table No.IV.2.35

Distribution of total stems by species and diameter in accessible tree forest area

Total area : 983397 ha.

Unit : ,000 stems

Species name	DIAMETER CLASSES (in cms) 10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
Abies pindrow	315.251	143.264	251.019	106.343	106.343	60.455	73.278	38.516	1026.642	0.4
Acacia catechu	2914.758	726.696	273.701	56.563	8.528	-	-	-	3980.246	1.5
Anogeissus latifolia	709.095	653.428	395.833	261.071	108.109	34.901	27.984	6.918	2197.339	0.8
Cedrus deodara	25.652	13.540	75.712	32.422	37.763	-	-	-	185.089	0.0
Dalbergia sissoo	1394.368	638.207	151.807	100.604	25.585	-	-	-	2310.571	0.9
Eucalyptus species	6520.759	215.460	16.543	-	-	-	-	-	6752.762	2.5
Lannea coromandelica	1567.197	968.121	498.563	149.397	56.275	-	-	-	3239.553	1.2
Ougeinia dalbergiodes	2452.914	1033.236	299.727	99.988	17.564	-	6.918	-	3910.347	1.5
Lyonia ovalifolia	10171.174	2820.975	961.559	339.788	93.996	54.417	-	22.180	14464.089	5.4
Pinus roxburghii	14861.205	9613.941	6649.827	3767.421	2029.066	535.837	109.020	26.962	37593.279	14.0
Quercus dilatata	2941.585	684.796	329.176	155.131	159.471	133.548	81.473	94.451	4479.631	1.7
Quercus incana	18063.520	5588.920	2469.795	1234.897	621.718	241.251	187.304	229.384	28636.789	10.7
Shorea robusta	15251.185	9356.290	5351.554	2810.133	1216.320	370.745	102.567	48.205	34506.999	12.9
Rhododendron arboreum	15021.590	5487.931	1969.204	780.473	409.326	153.541	46.123	45.196	23913.384	8.9
Quercus semicarpifolia	2638.087	1570.028	948.387	483.525	380.702	181.998	136.314	127.931	6466.972	2.4
Syzygium cumini	2301.762	1273.407	649.691	215.790	40.585	29.962	15.940	-	4527.137	1.7
Tectona grandis	1524.782	208.368	8.014	16.028	-	8.014	-	-	1765.206	0.7
Terminalia crenulata	1102.057	885.122	640.166	567.932	249.799	107.832	18.334	32.908	3604.150	1.3
Rest of the Spp.	61908.528	14005.064	4844.874	1782.194	672.477	407.114	331.718	338.024	84289.993	31.5
Total:-	161585.469	55886.794	26785.152	12959.700	6187.739	2332.438	1102.211	1010.675	267850.178	-
%	60.3	20.9	10.0	4.8	2.3	0.9	0.4	0.4	-	100.0

Table No.IV.2. 36

Distribution of stems per hectare by species and diameter class in accessible tree forest area

Total area : 983397 ha.

S.No.	Species name	DIAMETER CLASSES (in cms) 10-20	20-30	30-40	40-50	50-60	60-70	70-80	80+	Total	%
1.	Abies pindrow	0.320	0.146	0.255	0.108	0.061	0.075	0.039	0.039	1.043	0.4
2.	Acacia catechu	2.964	0.739	0.278	0.058	0.009	-	-	-	4.048	1.5
3.	Cedrus deodara	0.026	0.014	0.077	0.033	0.038	-	-	-	0.188	-
4.	Anogeissus latifolia	0.721	0.664	0.403	0.265	0.110	0.035	0.028	0.007	2.233	0.8
5.	Dalbergia sissoo	1.418	0.649	0.154	0.102	0.026	-	-	-	2.349	0.9
6.	Eucalyptus species	6.631	0.219	0.017	-	-	-	-	-	6.867	2.5
7.	Lannea coromandelica	1.594	0.984	0.507	0.152	0.057	-	-	-	3.294	1.2
8.	Ougeinia dalbergiodes	2.494	1.050	0.305	0.102	0.018	-	0.007	-	3.976	1.5
9.	Lyonia ovalifolia	10.343	2.868	0.978	0.346	0.096	0.055	-	0.023	14.709	5.4
10.	Pinus roxburghii	15.112	9.776	6.762	3.831	2.063	0.545	0.111	0.027	38.227	14.0
11.	Quercus dilatata	2.890	0.697	0.335	0.158	0.162	0.136	0.083	0.096	4.557	1.7
12.	Quercus incana	18.368	5.683	2.512	1.256	0.632	0.245	0.190	0.233	29.119	10.7
13.	Quercus semicarpifolia	2.687	1.597	0.965	0.492	0.387	0.185	0.139	0.130	6.577	2.4
14.	Rhododendron arboreum	15.275	5.581	2.003	0.794	0.416	0.156	0.047	0.046	24.318	8.9
15.	Shorea robusta	15.509	9.514	5.442	2.858	1.237	0.377	0.104	0.049	35.090	12.9
16.	Syzygium cumini	2.341	1.295	0.661	0.219	0.041	0.030	0.016	-	4.603	1.7
17.	Tectona grandis	1.550	0.212	0.008	0.016	-	0.008	-	-	1.794	0.7
18.	Terminalia crenulata	1.121	0.900	0.651	0.578	0.254	0.109	0.019	0.033	3.665	1.3
19.	Rest of the species	62.954	14.241	4.927	1.812	0.684	0.414	0.337	0.344	85.713	31.5
	Total:-	164.313	56.829	27.240	13.180	6.291	2.370	1.120	1.027	272.370	
	%	60.3	20.9	10.0	4.8	2.3	0.9	0.4	0.4		100.0

Contents

Appendix-I

Year of survey and publication of Survey of India topo maps used for forest inventory in Hill region of Uttar Pradesh.

S.No.	Topo-Sheet No.	Year of Survey	Year of publication
1.	53 F/11	1965-66	1969
2.	53 F/15	1965-66	1970
3.	53 F/16	1965-66	1969
4.	53 K/1	1966-67	1972
5.	53 K/5	1966-67	1971
6.	53 K/9	1966-67	1971
7.	53 K/10	1966-67	1970
8.	53 K/14	1966-67	1970
9.	53 K/15	1966-67	1970
10.	53 N/4	1963-64	1967
11.	53 N/8	1963-64	1967
12.	53 N/12	1963-64	1967
13.	53 N/16	1963-64	1967
14.	53 O/1	1963	1967
15.	53 O/2	1963-64	1967
16.	53 O/3	1964-65	1970
17.	53 O/4	1964-65	1970
18.	53 O/5	1963-64	1968
19.	53 O/6	1963	1967
20.	53 O/7	1964-65	1969
21.	53 O/8	1964-65	1974
22.	53 O/9	1963	1968
23.	53 O/10	1963	1967
24.	53 O/11	1964-65	1968
25.	53 O/12	1964-65	1968
26.	53 O/13	1963	1967
27.	53 O/14	1963	1966
28.	53 O/15	1963-64	1966
29.	53 O/16	1963-64	1966
30.	53 P/9	1969-70	1972
31.	53 P/13	1969-70	1972
32.	62 B/4	1963	1965
33.	62 B/8	1921-22,1963	1980
34.	62 B/12	1961-63	1980

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S.No.	Topo-Sheet No.	Year of Survey	Year of publication
35.	62 C/1	1963-64	1968
36.	62 C/2	1963-65	1967
37.	62 C/3	1963-64-65-66	1966
38.	62 C/4	1920-21	1923 & 1946
39.	62 C/5	1921-22,1961-62 1963-64,1965-66	1967
40.	62 C/6	1961-62	1967
41.	62 C/7	1961-62	1967
42.	62 C/8	1961-62	1967
43.	62 C/9	1961-62	1970
44.	62 D/1	1922-23	1940
45.	62 D/2	1964-65	1968
46.	53 J/3	1964-65	1972
47.	53 J/4	1964-65	1969
48.	53 J/8	1964-65	1967

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Appendix -II

LOCATION OF CENTRE OF SAMPLE PLOTS VISITED FOR FOREST INVENTORY

District:- Almora

Map sheet coverage : 53 N/12,16
53 O/1,2,5,6,9,10,11,13,14,15
62 C/1,2 (14 sheets)

Longitude E and Latitude N of plot centre	Forest Division code*	Land use code*	Forest type code*	Vol (m^3) per ha.	No. of trees per ha.
1	2	3	4	5	6
		Map sheet No. 53 N/12			
79 49 41 30 00 41	03	01	06	155.614	135
79 37 36 30 00 49	03	01	06	93.422	335
		Map sheet No. 53 N/16			
79 49 41 30 01 34	04	01	09	160.482	430
79 51 55 30 02 31	04	03	06	44.299	105
79 57 39 30 02 28	04	03	09	14.079	70
79 59 49 30 02 08	04	01	09	183.426	430
79 57 42 30 00 23	04	03	08	90.998	50
79 52 25 30 04 43	04	01	09	73.458	185
79 50 07 30 02 45	04	01	-	Inaccessible	
79 53 54 30 04 36	04	02	09	153.897	260
79 56 01 30 03 49	04	03	09	56.792	125
79 56 27 30 03 42	04	02	-	Inaccessible	
79 47 20 30 07 26	04	02	09	215.320	215
79 47 38 30 07 18	04	02	09	122.753	90
79 51 34 30 07 24	04	03	09	22.191	140
79 54 45 30 05 36	04	02	09	137.944	290

Contents

1	2	3	4	5	6
79 52 42 30 06 55	04	03	09	103.384	130
79 55 55 30 05 12	04	02	01	Inaccessible	
79 56 35 30 07 19	04	02	09	Inaccessible	
79 58 23 30 06 31	04	02	09	9.237	60
79 46 26 30 08 25	04	02	09	247.595	110
79 40 26 30 09 40	04	03	-	Inaccessible	
79 51 07 30 09 45	04	-	-	Inaccessible	
79 51 23 30 07 43	04	02	09	101.424	215
79 52 30 30 08 30	04	02	08	Inaccessible	
79 54 58 30 08 56	04	02	09	551.649	180
79 56 27 30 07 14	04	-	-	Inaccessible	
79 56 27 30 07 30	04	02	09	251.547	335
79 59 00 30 08 12	04	03	01	11.465	20
79 58 30 30 09 17	04	02	08	72.256	85
79 55 39 30 12 08	04	03	09	Inaccessible	
79 54 28 30 13 17	04	03	09	Inaccessible	
	Map sheet No. 53 O/1				
79 06 59 29 46 12	04	01	09	-	-
79 08 56 29 47 02	04	03	06	0.000	00
79 08 30 29 45 29	04	01	06	154.905	30
79 11 25 29 51 54	04	01	06	110.606	465
79 12 22 29 55 41	04	01	06	61.811	30
	Map sheet No. 53 O/2				
79 13 52 29 32 22	04	-	12	0.000	

Contents

1	2	3	4	5	6
79 06 52 29 34 45	08	01	20	223.000	195
79 07 57 29 33 03	08	01	20	161.579	105
79 12 19 29 34 11	04	01	-	Inaccessible	
79 10 11 29 33 17	04	01	20	41.620	65
79 12 49 29 34 08	04	01	06	80.518	80
79 14 41 29 33 24	04	01	08	39.587	40
79 05 56 29 35 11	07	01	20	197.829	160
79 07 33 29 36 44	04	01	20	167.306	125
79 09 58 29 35 55	04	01	06	0.000	00
79 10 52 29 35 00	04	01	06	69.705	15
79 11 38 29 37 28	03	12		0.000	00
79 13 51 29 36 00	03	10		0.000	00
79 12 28 29 38 19	04	01	11	-	-
79 13 44 29 38 09	04	01	11	27.424	135
79 13 16 29 42 07	04	01	06	0.000	00
79 12 00 29 44 21	04	01	09	28.701	110
79 10 30 29 43 06	04	10		0.000	00
	Map sheet No. 53 O/5				
79 17 33 29 46 37	04	03	06	73.830	30
79 28 14 29 47 00	04	01	06	115.179	120
79 23 21 29 49 21	04	01	06	133.758	40
79 24 06 29 48 04	04	01	06	59.885	170
79 26 28 29 48 27	04	01	09	62.295	280
79 29 32 29 48 42	04	01	-	Inaccessible	

Contents

1	2	3	4	4	6
79 18 19 29 50 37	04	01	06	106.665	200
79 20 17 29 51 51	04	01	06	152.362	50
79 23 23 29 52 21	04	01	-	Inaccessible	
79 25 06 29 52 21	04	01	06	55.641	25
79 28 23 29 51 17	04	01	06	99.768	125
79 29 00 29 51 11	04	01	09	274.042	370
79 17 18 29 53 35	04	01	06	9.225	65
79 19 21 29 52 30	04	03	06	5.200	30
79 21 55 29 54 10	04	01	06	62.795	130
79 23 21 29 54 21	04	01	20	4.906	20
79 25 13 29 54 28	04	01	08	141.001	305
79 27 18 29 53 02	04	01	06	64.649	20
79 28 24 29 54 43	04	01	09	-	-
79 29 08 29 52 44	04	01	06	147.371	150
79 16 34 29 55 08	04	01	06	164.867	90
79 22 02 29 55 57	04	01	09	-	-
79 23 40 29 55 48	04	01	06	-	-
79 29 08 29 56 44	04	01	09	281.744	425
79 28 18 29 55 47	04	01	06	72.287	145
79 28 13 29 58 44	04	01	09	292.971	405
79 29 19 29 58 42	04	01	09	225.937	305
	Map sheet No. 53 O/6				
79 16 22 29 36 12	04	01	06	19.000	95
79 15 10 29 37 00	04	01	08	81.834	180

Contents

1			2	3	4	5	6
79	20	43	04	01	09	145.743	250
29	36	59					
79	23	10	04	01	08	37.479	130
29	35	13					
79	26	03	04	01	06	127.959	75
29	37	16					
79	29	19	04	01	06	66.052	65
29	36	59					
79	20	06	04	01	06	99.229	70
29	38	22					
79	26	54	04	01	08	176.863	295
29	37	41					
79	29	37	04	01	06	157.938	170
29	38	50					
79	27	50	04	01	06	108.714	180
29	35	55					
79	20	57	04	01	06	25.856	105
29	40	44					
79	17	10	04	12	00	0.000	00
29	43	38					
79	22	45	04	01	06	90.925	150
29	42	56					
79	27	18	01	03	20	0.000	00
29	31	25					
79	25	22	04	13	00	0.000	00
29	34	18					

Map sheet No. 53 O/9

79	31	37	04	01	06	32.698	35
29	45	15					
79	34	53	04	01	06	174.552	145
29	46	05					
79	32	38	04	01	09	59.265	135
29	46	26					
79	37	18	04	01	06	235.891	155
29	47	22					
79	35	09	04	01	06	157.405	325
29	45	10					
79	42	00	04	01	06	92.378	165
29	45	07					
79	40	27	04	01	06	89.005	155
29	47	25					
79	43	02	03	01	06	180.323	60
29	46	56					
79	31	28	04	01	-	Inaccessible	
29	49	45					
79	30	59	04	12	00	0.000	00
29	47	46					

Contents

1	2	3	4	5	6
79 32 53 29 48 48	04	01	-	Inaccessible	
79 34 34 29 48 29	04	01	06	56.544	50
79 38 58 29 49 12	04	01	06	134.633	150
79 38 37 29 48 20	04	03	06	17.861	25
79 42 12 29 49 45	03	01	06	1.453	15
79 44 25 29 47 46	03	01	06	143.044	225
79 31 26 29 51 20	04	01	09	139.310	200
79 31 04 29 51 10	04	01	09	-	-
79 33 03 29 51 50	03	01	08	137.185	230
79 37 13 29 50 56	03	01	06	82.822	150
79 39 43 29 50 42	03	01	-	Inaccessible	
79 40 51 29 51 13	03	01	-	Inaccessible	
79 41 37 29 51 15	03	01	-	Inaccessible	
79 44 45 29 50 29	03	12	00	0.000	00
79 42 46 29 52 00	03	01	06	99.296	40
79 31 09 29 53 47	03	01	06	118.639	50
79 31 22 29 53 34	03	01	-	Inaccessible	
79 40 26 29 54 16	03	01	06	77.573	65
79 42 07 29 53 11	03	03	06	5.009	35
79 43 53 29 53 45	03	01	06	68.505	85
79 43 42 29 53 15	03	01	06	121.528	80
79 32 27 29 57 07	03	03	06	21.050	5
79 30 06 29 55 24	03	01	-	Inaccessible	
79 33 12 29 55 24	03	01	06	77.124	

Contents

1	2	3	4	5	6
79 34 23 29 59 49	03	13	00	0.000	00
79 36 01 29 57 50	03	03	06	0.000	00
79 42 01 29 55 42	03	01	08	86.247	315
79 44 41 29 56 56	03	01	-	Inaccessible	
79 42 49 29 55 33	03	01	06	69.151	45
79 30 47 29 56 49	03	03	06	0.000	00
79 31 44 29 57 59	03	01	06	124.259	360
79 33 38 29 59 39	03	01	06	-	-
79 33 52 29 57 53	03	01	06	143.540	200
79 36 01 29 58 06	03	01	06	158.883	165
79 36 29 29 59 44	03	01	06	117.059	145
79 39 39 29 58 19	03	03	06	29.439	10
79 40 35 29 57 34	03	01	06	60.003	165
79 41 54 29 59 56	01	03	06	98.097	60
79 44 21 29 59 48	03	01	-	Inaccessible	
79 43 10 29 57 43	03	01	06	178.466	155
	Map sheet No. 53 O/10				
79 40 57 29 31 28	03	01	06	90.440	45
79 41 36 29 31 02	03	01	06	223.096	65
79 42 42 29 30 07	03	03	06	15.604	30
79 31 25 29 34 46	04	01	06	67.572	80
79 34 22 29 34 20	04	01	06	169.381	110
79 32 15 29 35 03	04	01	20	94.030	165
79 32 34 29 36 05	04	01	20	66.021	150

Contents

1	2	3	4	5	6
79 38 12 29 37 02	04	01	06	174.662	65
79 43 03 29 35 06	04	01	06	65.719	140
79 30 27 29 37 44	04	01	-	Inaccessible	
79 32 05 29 38 49	04	01	06	199.829	70
79 41 21 29 38 56	04	01	06	17.771	15
79 36 49 29 42 02	04	03	06	83.163	15
79 39 26 29 40 37	04	12	00	0.000	00
79 41 51 29 41 37	04	03	06	41.083	45
79 40 42 29 40 52	04	01	06	185.686	105
79 53 10 29 41 31	04	01	06	192.257	105
79 44 21 29 40 59	04	01	06	223.741	75
79 31 10 29 43 58	04	03	06	0.000	00
79 34 17 29 44 38	04	01	08	175.765	215
79 33 14 29 42 47	04	01	06	95.903	130
79 37 31 29 44 11	04	01	06	207.237	70
79 35 04 29 43 14	04	01	06	115.433	190
79 39 48 29 44 50	04	01	06	76.966	140
79 42 54 29 42 54	04	01	06	8.474	60
	Map sheet No. 53 O/11				
79 41 57 29 28 34	01	01	06	166.988	250
79 43 17 29 28 19	01	12	00	0.000	00
	Map sheet No. 53 O/13				
79 53 13 29 46 50	03	01	-	Inaccessible	
79 59 52 29 46 33	03	01	06	133.162	35
79 57 36 29 46 02	03	01	08	-	-
79 46 14 29 47 51	03	01	06	0.00	

Contents

1	2	3	4	5	6
79 49 43 29 47 41	03	12	00	0.000	00
79 47 51 29 48 53	03	01	06	135.878	80
79 55 32 29 48 26	03	01	06	10.862	75
79 56 57 29 49 03	03	01	06	38.065	15
79 59 30 29 47 36	03	01	06	91.049	30
79 58 01 29 59 41	03	01	06	98.609	30
79 45 56 29 51 27	03	01	06	47.789	160
79 48 29 29 46 30	03	01	06	65.499	70
79 49 06 29 50 56	03	01	06	16.570	5
79 51 12 29 52 27	03	01	06	0.000	00
79 51 16 29 50 32	03	01	06	13.768	80
79 51 56 29 50 44	03	01	06	146.361	100
79 54 56 29 51 43	03	01	06	70.471	35
79 57 29 29 50 43	03	12	00	0.000	00
79 55 02 29 51 46	03	01	06	79.258	110
79 57 40 29 50 49	03	01	06	45.964	110
79 51 00 29 53 46	03	15	00	0.000	00
79 51 33 29 53 44	03	01	-	Inaccessible	
79 50 30 29 52 52	03	01	06	40.396	70
79 50 11 29 52 35	03	01	06	45.247	30
79 52 57 29 53 08	03	01	06	78.138	60
79 54 36 29 54 22	03	01	-	Inaccessible	
79 55 02 29 54 25	03	01	06	64.234	205
79 57 48 29 55 17	03	12	00	0.000	00

Contents

1	2	3	4	5	6
79 57 27 29 54 57	03	01	09	157.009	395
79 45 09 29 56 54	03	01	06	88.528	55
79 48 38 29 56 24	03	01	06	76.127	95
79 48 34 29 56 18	03	01	06	56.346	65
79 52 05 29 55 17	03	01	06	56.134	60
79 50 09 29 55 54	03	01	06	36.077	10
79 52 42 29 55 07	03	11	00	0.000	00
79 57 51 29 55 17	03	01	-	Inaccessible	
79 45 56 29 56 52	03	03	06	80.853	25
79 46 39 29 55 27	03	01	09	44.159	70
79 49 06 29 59 28	03	01	06	47.582	15
79 48 24 29 57 58	03	01	08	63.818	40
79 52 05 29 59 37	03	01	20	96.501	390
79 54 18 29 57 59	03	01	08	90.159	80
79 52 36 29 59 57	03	01	06	167.957	105
79 54 43 29 57 31	03	03	06	0.000	00
79 50 19 29 58 16	03	01	06	59.858	280
79 54 17 29 58 21	03	03	06	95.694	45
	Map sheet No. 53 O/14				
79 48 47 29 31 56	03	01	06	6.697	35
79 51 58 29 31 50	03	01	06	70.174	105
79 52 46 29 32 05	03	01	06	37.768	30
79 54 36 29 30 32	03	01	20	33.953	250
79 56 45 29 32 16	03	03	06	3.396	20
79 46 25 29 34 14	03	01	06	76.201	

Contents

1	2	3	4	5	6
79 46 02 29 33 12	03	01	06	42.602	130
79 49 47 29 33 35	03	01	06	98.605	195
79 56 07 29 34 30	03	01	06	28.903	40
79 48 33 29 35 08	03	13	00	0.000	00
79 50 40 29 39 36	03	01	09	46.959	165
79 51 42 29 37 40	03	13	00	0.000	00
79 52 52 29 36 32	03	01	09	85.191	310
79 59 06 29 35 05	03	01	06	71.380	95
79 58 24 29 37 24	03	01	06	32.093	125
79 48 24 29 51 54	03	01	06	56.655	60
79 50 46 29 39 54	04	01	20	68.458	160
79 51 42 29 37 40	03	12	00	0.000	00
79 54 08 29 38 51	03	01	06	86.710	35
79 53 12 29 38 40	03	03	06	74.527	30
79 57 30 29 39 00	03	01	06	152.888	95
79 58 03 29 38 56	03	01	11	104.938	225
79 47 02 29 42 29	03	01	06	118.461	285
79 45 28 29 40 03	03	01	06	32.016	85
79 49 15 29 40 43	03	12	00	0.000	00
79 48 12 29 41 48	03	03	06	0.000	00
79 54 00 29 41 37	03	03	06	55.280	20
79 54 27 29 41 27	03	03	06	0.316	5
79 52 55 29 41 06	03	01	-	Inaccessible.	

Contents

1	2	3	4	5	6
79 56 12 29 40 08	03	03	06	-	-
79 45 48 29 42 51	03	01	-	Inaccessible	
79 46 34 29 43 01	03	01	06	64.160	180
79 49 30 29 43 25	03	01	06	178.255	95
79 48 01 29 49 09	03	12	00	0.000	00
79 50 53 29 42 34	03	03	06	-	-
79 53 24 29 42 59	03	03	20	2.844	20
	Map sheet No. 53 O/15				
79 46 57 29 27 16	02	01	09	146.222	190
79 48 16 29 27 02	02	01	06	73.187	70
79 50 18 29 25 40	02	01	06	113.101	30
79 45 54 29 29 24	02	01	06	60.381	125
	Map sheet No. 62 B/4				
80 01 33 30 00 57	03	01	09	193.823	360
80 00 56 30 01 35	03	01	09	188.684	325
80 02 40 30 04 39	03	02	09	84.181	115
80 00 26 30 06 39	04	02	09	Inaccessible	
80 02 01 30 05 41	03	04	00	0.000	00
80 03 04 30 05 10	03	02	09	58.939	115
80 04 15 30 07 14	03	02	09	84.772	160
80 00 22 30 12 20	04	03	-	Inaccessible	
	Map sheet No. 62 C/1				
80 02 04 29 46 51	03	01	06	113.679	115
80 01 17 29 49 48	03	01	06	158.097	90
80 06 54 29 48 39	03	01	06	55.724	230

Contents

1			2	3	4	5	6
80	00	35	03	01	09	258.004	595
29	50	13					
80	01	54	03	02	09	Inaccessible	
29	55	43					
80	00	40	03	02	09	0.000	00
29	56	40					
80	04	44	03	02	06	73.881	40
29	56	40					
80	05	43	03	13	00	0.000	00
29	56	42					
80	07	48	03	03	20	0.000	00
29	56	37					
80	04	34	03	02	09	69.072	320
29	58	16					
80	02	59	03	01	09	183.858	320
29	59	08					
			Map sheet No. 62 C/2				
80	02	15	03	01	-	Inaccessible	
29	31	44					
80	02	01	03	01	08	81.552	65
29	30	39					

Total = 281 points

Contents

District : Garhwal

Map sheet coverage : 53 J/8
53 K/1,5,9,10,14,15
53 N/4
53 O/1,2 (10 sheets)

Longitude E and Latitude N of plot centre			Forest Division code*	Land use code*	Forest type code*	Vol (m^3) per ha.	No. of trees per ha.	
Degree	Minute	Second						
	1		2	3	4			
78 30	16 01	10 05	10	01	20	25.573	60	Map sheet No. 53 J/8
			Map sheet No. 53 J/8					
78 30	19 01	50 07	10	01	20	150.105	115	
78 30	17 01	42 18	10	01	20	180.709	310	
78 30	21 00	29 44	10	01	11	148.506	165	
78 30	22 01	37 54	10	03	11	39.367	15	
78 30	24 00	49 31	10	13	00	0.000	00	
78 30	27 01	18 31	10	03	20	4.636	15	
78 30	28 02	45 02	10	13	00	0.000	00	
78 30	28 00	44 24	10	13	00	0.000	00	
78 30	18 04	27 54	10	01	20	55.142	120	
78 30	19 02	06 41	10	01	20	29.032	75	
78 30	20 04	32 39	10	03	20	26.617	30	
78 30	24 04	14 20	10	01	20	72.589	170	
78 30	23 03	21 14	10	04	00	0.000	00	
78 30	26 04	48 21	10	01	-	Inaccessible		
78 30	19 05	42 14	10	01	20	112.036	120	
78 30	20 07	48 24	10	01	20	-	-	

Contents

1			2	3	4	5	6
78	24	35	10	03	20	0.000	00
30	05	36					
78	22	58	10	01	11	51.764	70
30	06	49					
			Map sheet No. 53 K/1				
78	14	19	10	01	11	239.803	225
29	56	44					
78	14	20	10	01	11	152.656	120
29	58	25					
			Map sheet No. 53 K/5				
78	29	00	10	01	20	77.133	90
29	47	13					
78	22	00	10	01	20	42.677	135
29	48	37					
78	20	28	10	01	20	65.739	150
29	48	52					
78	22	42	10	01	20	103.571	145
29	48	14					
78	24	42	10	01	20	-	-
29	49	16					
78	25	17	10	01	-	Inaccessible	
29	47	04					
78	27	10	10	01	20	-	-
29	47	41					
78	27	48	10	01	20	106.706	170
29	48	58					
78	29	43	10	01	20	180.775	145
29	48	24					
78	19	52	10	01	20	87.655	80
29	52	18					
78	20	13	10	01	11	142.811	70
29	52	19					
78	22	14	10	01	11	39.020	75
29	50	09					
78	22	36	10	01	11	204.789	60
29	52	46					
78	24	58	10	01	20	107.845	160
29	50	42					
78	28	41	10	01	20	34.185	65
29	50	14					
78	17	43	10	01	20	44.726	80
29	54	26					
78	19	42	10	01	20	24.786	40
29	52	58					
78	22	20	10	01	11	49.339	200
29	53	57					
78	20	04	10	01	20	43.241	90
29	53	34					

Contents

1			2	3	4	5	6
78 29	23 52	46 31	10	01	20	43.689	55
78 29	25 53	32 24	10	01	20	89.839	90
78 29	17 57	19 18	10	01	20	190.611	145
78 29	19 55	22 20	10	01	20	202.869	100
78 29	18 57	10 15	10	01	11	155.283	95
78 29	20 55	53 02	10	01	20	81.036	90
78 29	16 59	52 00	10	01	20	144.591	80
78 29	15 58	34 33	10	01	11	110.196	190
78 29	19 58	37 17	10	01	11	142.828	95
78 29	17 59	56 14	10	01	-	Inaccessible	
			Map sheet No. 53 K/9				
78 29	30 45	44 36	10	01	10	36.275	95
78 29	31 46	46 48	10	01	20	27.728	20
78 29	34 45	48 58	10	03	20	0.000	00
78 29	32 46	42 24	10	01	11	225.899	160
78 29	35 46	06 50	10	01	20	79.951	95
78 29	37 45	25 34	10	01	20	139.256	145
78 29	38 47	22 10	10	01	11	309.780	220
78 29	39 45	06 14	10	01	11	122.092	130
78 29	41 46	31 32	07	01	20	303.672	305
78 29	40 45	54 50	07	01	20	190.283	130
78 29	42 46	40 42	07	01	11	163.986	240
78 29	31 48	48 37	10	01	20	19.065	15
78 29	34 48	20 52	10	01	20	46.681	125
78 29	33 48	11 38	10	03	20	45.812	

Contents

1			2	3	4	5	6
78	37	16	10	01	20	188.879	85
29	47	29					
78	38	15	10	13	00	0.000	00
29	49	15					
78	44	10	10	01	08	5.405	20
29	48	20					
78	30	58	10	12	00	0.000	00
29	50	31					
78	33	10	10	01	20	154.671	260
29	50	51					
78	37	07	10	03	08	0.225	5
29	50	22					
78	38	33	10	17	00	0.000	00
29	50	28					
78	44	12	10	01	08	54.516	105
29	50	47					
78	30	28	10	01	11	184.513	80
29	53	33					
78	39	16	10	04	00	0.000	00
29	53	06					
78	41	47	10	03	20	1.716	10
29	54	27					
78	40	40	10	01	08	68.832	140
29	53	06					
78	43	35	10	12	00	0.000	00
29	53	44					
78	40	31	10	01	20	53.916	185
29	56	39					
			Map sheet No. 53 K/10				
78	40	40	07	03	20	11.143	50
29	30	40					
78	41	49	07	01	20	15.018	55
29	30	40					
78	44	05	07	01	11	179.205	325
29	31	17					
78	43	29	07	03	20	133.060	125
29	30	57					
78	39	55	07	03	20	164.155	75
29	33	38					
78	37	33	07	01	20	36.573	315
29	33	41					
78	41	03	07	01	20	462.566	140
29	34	02					
78	41	27	07	03	20	64.635	60
29	33	33					
78	42	27	07	01	11	-	-
29	33	52					
78	43	00	07	17	00	0.000	00
29	33	46					

Contents

1			2	3	4	5	6
78	35	41	07	01	20	57.572	85
29	36	06					
78	36	47	07	01	20	108.165	160
29	36	26					
78	39	14	07	Inaccessible			
29	37	08					
78	38	16	07	01	11	172.455	175
29	35	22					
78	41	47	07	Inaccessible			
29	35	46					
78	40	38	07	17	Inaccessible		
29	36	43					
78	43	17	07	01	20	93.482	75
29	36	46					
78	44	13	07	01	Inaccessible		
29	35	43					
78	31	50	10	01	20	23.179	80
29	38	44					
78	33	58	10	01	20	63.158	120
29	37	37					
78	33	37	10	01	11	219.279	110
29	39	57					
78	36	19	07	-	Inaccessible		
29	39	02					
78	36	06	07	01	20	-	-
29	38	30					
78	39	51	07	01	11	209.666	75
29	39	58					
78	39	15	07	01	11	206.984	130
29	37	33					
78	40	08	07	01	11	163.595	90
29	39	11					
78	42	19	07	01	20	125.290	80
29	38	22					
78	38	07	07	01	11	281.146	165
29	39	58					
78	39	22	07	01	11	158.275	75
29	37	35					
78	32	07	10	01	20	115.122	335
29	40	46					
78	32	53	10	01	20	42.326	100
29	41	15					
78	34	37	10	01	11	170.155	60
29	41	16					
78	37	50	07	01	11	42.859	80
29	40	12					

Contents

1			2	3	4	5	6
78	38	28	10	01	11	127.550	185
29	41	42					
78	39	03	07	01	20	115.815	55
29	40	45					
78	40	31	07	01	11	221.263	140
29	41	13					
78	41	57	07	01	11	248.374	320
29	41	14					
78	43	19	07	01	11	335.554	120
29	42	23					
78	44	12	07	01	11	221.724	135
29	40	06					
78	33	48	10	03	20	131.255	75
29	43	24					
78	34	07	10	01	11	5.127	10
29	44	09					
78	36	03	10	01	20	138.514	60
29	43	42					
78	36	07	10	01	20	175.326	75
29	43	50					
78	37	30	10	01	11	217.263	195
29	42	50					
78	39	58	10	-	-	Inaccessible	
29	44	40					
78	42	13	07	01	11	187.501	275
29	43	20					
78	40	14	10	-	-	Inaccessible	
29	44	11					
78	42	34	07	01	20	77.371	135
29	44	57					
78	44	58	07	03	20	395.145	210
29	42	34					
			Map sheet No. 53 K/14				
78	46	12	07	17	-	Inaccessible	
29	36	18					
78	46	12	07	01	-	Inaccessible	
29	36	12					
78	47	35	07	-	-	Inaccessible	
29	35	50					
78	49	53	07	01	11	153.933	155
29	36	41					
78	45	18	07	01	20	-	-
29	39	54					
78	47	10	07	01	11	262.531	170
29	37	33					
78	47	33	07	01	11	243.073	250
29	38	31					
78	49	59	07	01	11	160.723	160
29	38	57					

Contents

1			2	3	4	5	6
78 29	46 41	11 42	07	01	11	152.147	205
78 29	46 40	14 45	07	01	11	176.443	300
78 29	50 40	00 54	07	01	20	176.868	145
78 29	47 41	32 39	07	01	20	139.189	255
78 29	46 44	09 57	07	12	00	0.000	00
78 29	46 42	19 34	07	01	11	276.547	305
78 29	48 44	18 42	07	01	11	147.994	255
			Map sheet No. 53 K/15 -				
78 29	51 26	46 42	07	01	20	80.099	240
78 29	52 26	34 42	08	01	20	47.584	90
			Map sheet No. 53 N/4				
79 30	00 00	22 07	09	13	00	0.000	00
79 30	02 02	05 21	09	13	00	0.000	00
79 30	09 00	29 51	04	01	08	430.359	135
79 30	07 01	44 28	09	01	09	331.555	490
79 30	11 02	00 00	04	01	09	247.552	85
79 30	11 00	25 25	04	01	09	124.361	230
79 30	01 03	18 50	09	01	09	149.059	230
79 30	01 03	10 33	09	01	09	176.539	510
79 30	04 03	04 35	09	01	09	110.576	315
79 30	03 03	30 49	09	01	09	128.860	325
79 30	07 02	10 41	09	01	06	215.288	220
79 30	07 04	38 49	09	01	09	117.122	245
79 30	09 02	45 38	09	01	09	122.868	350
79 30	10 03	20 03	09	01	01	400.042	

Contents

1			2	3	4	5	6
79	00	29	09	01	06	60.701	100
30	06	25					
79	06	22	09	01	09	272.549	200
30	07	11					
79	08	28	09	01	01	199.654	90
30	06	28					
79	08	48	09	01	01	305.815	105
30	06	10					
79	10	09	09	01	08	329.496	235
30	05	04					
79	02	09	09	01	06	103.893	95
30	09	19					
79	03	29	09	01	09	44.491	115
30	09	20					
79	05	21	09	01	08	59.786	260
30	09	46					
79	07	05	09	01	09	234.124	180
30	07	42					
79	07	27	09	01	09	134.789	150
30	09	40					
79	02	26	09	01	06	77.263	180
30	11	02					
79	00	00	09	01	09	47.886	150
30	11	26					
79	04	31	09	12	00	0.000	00
30	11	20					
79	03	05	09	03	09	47.518	70
30	11	06					
79	06	44	09	01	09	50.309	80
30	10	28					
79	05	42	09	01	09	180.095	135
30	11	56					
79	01	24	09	03	09	-	-
30	12	56					
79	01	04	09	01	08	100.424	40
30	14	34					
79	03	57	09	11	00	0.000	00
30	12	42					
			Map sheet No. 53 O/1				
79	01	44	09	03	08	33.250	30
29	45	38					
79	00	43	09	01	08	93.081	200
29	46	46					
79	04	24	09	12	00	0.000	00
29	45	46					
79	03	06	09	01	08	94.298	210
29	46	39					

Contents

1			2	3	4	5	6
79 29	05 46	30 14	09	01	09	-	-
79 29	01 48	54 18	09	03	06	18.752	10
79 29	00 49	35 14	09	03	08	16.311	40
79 29	03 47	16 33	09	01	08	134.346	445
79 29	05 48	42 18	09	12	00	0.000	00
79 29	04 51	06 56	09	03	09	11.935	11
79 29	05 50	25 14	09	12	00	0.000	00
79 29	01 56	00 46	09	03	09	3.367	05
79 29	01 55	29 42	09	03	09	24.409	80
79 29	03 57	04 05	09	03	06	43.112	10
79 29	07 56	48 09	04	03	09	17.817	55
79 29	10 56	08 48	04	01	06	48.891	10
79 29	01 58	32 48	09	03	09	0.000	00
79 29	05 58	29 33	09	01	09	125.965	250
79 29	09 57	12 40	04	10	00	0.000	00
79 29	11 59	48 56	04	01	09	92.684	300
			Map sheet No. 53 O/2				
79 29	00 36	16 12	07	01	11	195.067	365
79 29	02 36	12 16	07	01	09	112.604	155
79 29	04 37	05 18	07	-	-	Inaccessible	
79 29	03 37	48 21	07	06	00	0.000	00
79 29	03 40	12 56	07	03	11	0.000	00

Total:- 202 Points

Contents

District : Chamoli

Map sheet coverage : 53 N/4,8,12
53 O/1,5 (5 sheets)

Longitude E and Latitude N of plot centre			Forest Division code*	Land use code*	Forest type code*	Vol (m^3) per ha.	No. of trees per ha.
Degree	Minute	Second					
1			2	3	4	5	6
			Map sheet No. 53 N/4				
79	13	41	04	01	09	179.605	230
30	00	48					
79	13	53	04	01	09	57.794	95
30	01	42					
79	12	13	04	01	09	162.254	25
30	04	26					
79	13	51	04	01	09	44.807	140
30	04	23					
79	14	42	04	01	09	-	-
30	03	09					
79	12	25	11	01	09	-	-
30	07	30					
79	14	29	12	01	09	108.896	390
30	05	47					
79	09	58	11	01	09	148.472	70
30	07	50					
79	13	04	11	01	09	44.096	175
30	08	33					
79	14	30	12	01	09	35.255	370
30	08	59					
79	08	40	11	03	09	0.000	00
30	11	08					
79	10	33	11	01	09	49.888	370
30	10	10					
79	13	51	12	03	09	0.305	05
30	10	06					
79	03	39	11	03	06	84.352	20
30	14	49					
79	06	08	11	03	09	5.974	20
30	13	57					
79	08	49	11	01	09	163.373	320
30	13	32					
79	08	47	11	03	09	60.718	195
30	14	01					

Contents

1			2	3	4	5	6
79	11	02	11	01	06	-	-
30	14	19					
79	11	31	11	01	09	72.090	370
30	13	15					
			Map sheet No. 53 N/8				
79	16	13	04	01	09	18.504	125
30	00	27					
79	16	42	04	03	09	72.386	80
30	02	08					
79	19	38	04	01	09	35.719	165
30	01	58					
79	20	43	04	01	06	199.520	75
30	01	53					
79	21	50	04	01	09	-	-
30	00	35					
79	24	29	04	01	09	136.631	220
30	01	38					
79	23	07	04	01	09	-	-
30	00	53					
79	25	51	04	01	09	-	-
30	01	33					
79	26	38	04	01	09	-	-
30	00	57					
79	28	26	04	01	09	69.924	100
30	00	18					
79	29	10	12	01	09	195.962	400
30	02	16					
79	15	34	04	01	09	2.623	10
30	02	08					
79	19	54	04	01	09	78.111	260
30	03	18					
79	20	12	04	01	09	203.313	500
30	02	37					
79	24	21	12	01	-	Inaccessible	
30	03	25					
79	23	14	12	01	09	133.091	220
30	04	06					
79	25	35	12	01	09	124.333	250
30	02	58					
79	28	00	12	01	09	57.363	125
30	02	52					
79	15	21	04	01	09	47.233	285
30	05	27					
79	17	13	11	01	09	112.828	270
30	07	04					
79	18	54	12	13	00	0.000	00
30	06	13					

Contents

1			2	3	4	5	6
79	18	43	12	01	09	83.926	145
30	06	18					
79	20	24	12	01	09	219.645	355
30	05	13					
79	28	57	12	01	06	119.013	320
30	05	58					
79	28	32	12	01	06	128.249	105
30	06	17					
79	15	13	11	01	09	66.067	420
30	08	01					
79	18	00	12	01	09	117.511	255
30	09	26					
79	20	41	12	03	06	73.693	45
30	09	16					
79	21	44	12	01	06	81.021	45
30	08	18					
79	26	44	12	01	09	54.302	130
30	09	47					
79	25	41	12	01	08	47.372	180
30	07	44					
79	28	12	12	01	09	149.139	285
30	09	30					
79	16	16	12	12	00	0.000	00
30	12	06					
79	16	10	12	03	09	28.350	105
30	10	22					
79	19	56	12	03	06	1.374	05
30	10	40					
79	21	42	12	01	06	62.585	185
30	12	06					
79	23	06	12	03	08	25.782	80
30	11	10					
79	24	24	12	01	09	-	-
30	11	19					
79	26	25	12	01	09	137.646	235
30	10	16					
79	26	03	12	01	09	106.935	315
30	12	10					
79	29	06	12	01	09	155.799	240
30	10	45					
79	18	57	12	01	09	65.385	90
30	14	34					
79	20	02	12	01	06	43.820	40
30	13	32					
79	22	25	12	01	09	68.948	75
30	13	56					
79	23	19	12	01	09	23.542	110
30	14	46					

Contents

1			2	3	4	5	6
79	24	09	12	01	09	67.491	225
30	12	43					
79	26	21	12	01	09	114.679	140
30	12	59					
79	26	09	12	01	09	11.252	10
30	14	32					
79	29	29	12	-	-	Inaccessible	
30	14	47					
			Map sheet No. 53 N/12				
79	32	22	12	01	06	106.773	130
30	01	00					
79	30	05	12	01	09	160.591	420
30	01	28					
79	32	55	12	01	09	200.089	570
30	00	16					
79	35	42	12	01	08	108.397	167
30	01	44					
79	39	56	12	03	06	138.789	25
30	01	38					
79	42	14	12	01	08	59.481	220
30	00	44					
79	40	13	12	03	06	58.151	25
30	01	44					
79	44	33	12	03	06	56.298	20
30	01	18					
79	42	48	12	01	06	-	-
30	01	07					
79	30	47	12	01	06	-	-
30	04	33					
79	39	34	12	01	09	134.349	255
30	03	34					
79	37	52	12	03	09	69.365	180
30	03	58					
79	40	08	12	01	09	282.566	455
30	03	48					
79	42	16	12	-	-	Inaccessible	
30	03	40					
79	43	25	12	03	09	60.809	65
30	03	32					
79	44	01	12	01	08	163.306	185
30	03	58					
79	31	04	12	01	09	153.704	335
30	06	16					
79	31	25	12	01	06	117.209	115
30	06	10					
79	34	58	12	01	09	232.148	265
30	06	38					
79	35	54	12	01	09	51.49	
30	06	22					

Contents

1			2	3	4	5	6
79	38	30	12	12	00	0.000	00
30	05	40					
79	38	50	12	01	-	Inaccessible	
30	06	46					
79	40	50	12	01	-	Inaccessible	
30	05	15					
79	44	36	12	01	09	219.481	260
30	05	33					
79	42	49	12	01	-	Inaccessible	
30	06	54					
79	30	11	12	12	00	0.000	00
30	08	40					
79	32	16	12	01	09	56.124	265
30	08	48					
79	34	44	12	01	09	260.458	330
30	09	05					
79	36	18	12	01	-	Inaccessible	
30	09	06					
79	36	10	12	01	09	4.106	10
30	08	25					
79	43	05	12	01	09	71.008	95
30	07	48					
79	44	20	12	01	-	Inaccessible	
30	09	42					
79	34	20	12	11	00	0.000	00
30	11	50					
79	33	11	12	-	-	Inaccessible	
30	10	34					
79	37	18	12	01	09	157.772	130
30	11	05					
79	35	07	12	10	00	0.000	00
30	11	23					
79	39	07	12	01	01	132.094	200
30	12	26					
79	40	03	12	01	08	0.000	00
30	11	58					
79	42	20	12	01	09	91.981	170
30	10	30					
79	44	01	12	-	-	Inaccessible	
30	10	53					
79	33	48	12	-	-	Inaccessible	
30	14	34					
79	35	51	12	10	00	0.000	00
30	13	16					
79	36	36	12	01	09	45.597	60
30	14	18					
79	38	34	12	01	-	Inaccessible	
30	13	21					

Contents

1			2	3	4	5	6
79	38	46	12	10	00	0.000	00
30	14	11					
79	40	04	12	-	-	Inaccessible	
30	13	36					
79	31	28	12	02	09	0.000	00
30	11	40					
79	30	58	12	02	09	0.000	00
30	10	45					
79	32	14	12	10	00	0.000	00
30	14	16					
79	30	12	12	02	09	0.000	00
30	13	16					
			Map sheet No. 53 O/1				
79	14	15	04	01	09	150.693	215
29	59	51					
			Map sheet No. 53 O/5				
79	23	50	04	01	06	112.111	85
29	56	42					
79	26	43	04	01	06	65.124	120
29	57	27					
79	15	57	04	01	09	164.085	80
29	57	56					
79	21	49	04	01	09	99.732	325
29	59	07					
79	20	47	04	01	06	-	-
29	58	26					
79	22	02	04	01	09	-	-
29	58	41					
79	24	57	04	01	06	67.478	15
29	58	48					
79	27	01	04	01	09	74.247	320
29	58	31					

Total :- 127 points

Contents

District : Tehri

Map sheet coverage : 53 J/3,8 (2 sheets)

Longitude E and Latitude N of plot centre			Forest Division code*	Land use code*	Forest type code*	Vol (m^3) per ha.	No. of trees per ha.
Degree	Minute	Second					
1			2	3	4	5	6
			Map sheet No. 53 J/3				
78 30	10 19	16 20	13	01	20	120.902	195
78 30	09 21	44 36	13	01	08	26.063	85
78 30	11 22	26 07	13	01	09	102.226	170
78 30	12 20	32 19	13	01	-	Inaccessible	
78 30	14 22	55 07	13	01	08	-	-
78 30	14 23	40 10	13	01	09	123.652	380
78 30	11 27	30 07	17	01	09	135.002	95
78 30	01 29	36 00	17	12	00	0.000	00
78 30	04 29	44 28	17	03	20	17.270	70
78 30	06 29	12 00	17	01	09	42.114	200
78 30	07 29	38 30	17	01	09	126.526	420
78 30	09 28	46 06	17	01	08	82.223	215
78 30	11 27	31 58	17	12	00	0.000	00
78 30	12 29	08 34	17	04	00	0.000	00
78 30	13 29	01 05	17	11	00	0.000	00
78 30	14 28	24 31	17	11	00	0.000	00
			Map sheet No. 53 J/8				
78 30	28 00	46 25	13	01	20	70.189	240
78 30	17 07	50 18	13	03	20	6.475	10

Contents

1			2	3	4	5	6
78	26	30	13	01	20	-	-
30	05	26					
78	25	58	13	01	20	147.531	175
30	07	04					
78	29	33	13	01	20	122.738	180
30	05	09					
78	29	59	13	01	20	58.548	165
30	07	18					
78	16	21	13	01	20	285.533	205
30	10	25					
78	19	13	13	01	20	125.931	110
30	09	33					
78	18	53	13	03	20	68.531	125
30	10	49					
78	21	39	13	03	20	-	-
30	07	54					
78	22	28	13	01	20	-	-
30	10	00					
78	25	19	13	04	00	0.000	00
30	09	30					
78	27	09	13	03	06	0.000	00
30	08	08					
78	29	23	13	01	06	-	-
30	09	54					
78	28	10	13	03	20	-	-
30	07	39					
78	16	20	13	01	20	116.930	135
30	10	25					
78	16	14	13	01	20	218.977	50
30	12	09					
78	18	51	13	01	20	21.668	65
30	10	50					
78	20	00	13	01	09	34.386	120
30	12	54					
78	22	33	13	03	09	-	-
30	10	06					
78	22	59	13	12	00	0.000	00
30	10	26					
78	24	36	13	01	09	45.391	225
30	12	05					
78	26	00	13	04	00	0.000	00
30	12	14					
78	26	32	13	01	11	119.891	205
30	10	17					
78	16	37	13	01	09	68.995	220
30	12	59					
78	19	22	13	03	20	0.000	
30	14	17					

Contents

1			2	3	4	5	6
78	18	11	13	04	00	0.000	00
30	13	16					
78	26	52	13	03	06	1.354	10
30	14	03					
78	25	40	13	03	09	113.460	90
30	13	29					
78	29	50	13	03	06	0.000	00
30	12	50					

Total:- 46 points

Contents

District : Pithoragarh

Map sheet coverage : 53 O/13,14,15,16
62 B/4,8,12
62 C/1,2,3,4,5,6,7,8,9 (16 sheets)

Longitude E and Latitude N of plot centre			Forest Division code*	Land use code*	Forest type code*	Vol (m^3) per ha.	No. of trees per ha.
Degree	Minute	Second					
1			2	3	4	5	6
			Map sheet No. 53 O/13				
79 29	52 46	07 36	02	-	-	Inaccessible	
79 29	55 47	11 13	02	01	06	114.531	75
			Map sheet No. 53 O/14				
79 29	59 38	28 36	03	01	11	144.370	105
79 29	57 42	56 08	03	03	06	80.093	30
79 29	56 43	47 47	03	01	06	86.554	100
			Map sheet No. 53 O/15				
79 29	49 16	12 34	05	01	-	Inaccessible	
79 29	52 16	54 42	02	01	06	71.999	150
79 29	55 16	07 47	02	01	06	250.306	155
79 29	57 15	25 43	02	01	06	171.289	115
79 29	59 16	25 28	02	01	06	76.057	90
79 29	58 16	11 01	02	01	09	128.287	125
79 29	48 18	51 56	02	01	09	158.408	245
79 29	51 18	16 27	02	01	06	134.432	130
79 29	53 19	09 58	02	01	06	109.142	75
79 29	54 17	23 33	02	03	06	16.473	20
79 29	55 19	20 08	02	01	06	82.311	70

Contents

1			2	3	4	5	6
79	57	13	02	01	06	117.904	125
29	18	22					
79	57	58	02	03	09	4.416	20
29	19	24					
79	59	36	02	01	06	69.927	195
29	18	06					
79	54	39	02	01	05	137.167	90
29	20	53					
79	55	11	02	13	00	0.000	00
29	21	44					
79	57	19	02	03	06	0.000	00
29	20	42					
79	59	32	02	01	09	92.137	200
29	20	38					
79	50	52	02	01	06	24.983	70
29	24	36					
79	51	41	02	01	06	51.610	60
29	22	54					
79	53	22	02	01	06	161.624	160
29	22	49					
79	54	12	02	01	06	56.907	120
29	24	42					
79	57	11	02	01	06	1.561	05
29	22	36					
79	58	02	02	01	06	95.304	95
29	22	36					
79	59	31	02	10	00	0.000	00
29	24	54					
79	57	22	02	01	06	121.193	35
29	27	05					
79	57	06	02	01	06	17.884	15
29	28	09					
79	57	59	02	04	00	0.000	00
29	28	01					
			Map sheet No. 53 O/16				
79	58	25	05	01	11	235.120	180
29	04	58					
79	59	46	05	01	11	240.485	175
29	05	25					
79	53	04	05	01	20	161.474	230
29	08	28					
79	59	30	05	01	11	100.905	150
29	09	05					
79	57	09	05	-	-	Inaccessible	
29	07	49					
79	55	22	05	01	08	25.442	30
29	08	43					

Contents

1			2	3	4	5	6
79 29	58 09	56 47	05	01	20	274.738	200
79 29	58 07	37 54	05	01	20	90.507	80
79 29	59 10	29 10	02	01	20	90.314	180
79 29	58 12	02 49	02	-	-	Inaccessible	
79 29	56 14	19 12	02	03	20	21.869	35
79 29	56 13	07 02	02	01	06	71.801	90
79 29	57 12	50 49	02	01	11	158.610	165
			Map sheet No. 62 B/4				
80 30	04 01	35 55	03	13	00	0.000	00
80 30	06 00	17 18	03	01	09	464.623	105
80 30	06 02	07 09	03	01	09	233.252	285
80 30	07 02	40 01	03	02	09	156.800	210
80 30	12 02	30 08	03	01	08	367.318	280
80 30	13 00	12 29	03	03	-	Inaccessible	
80 30	14 02	26 02	02	02	-	Inaccessible	
80 30	04 02	45 24	03	02	09	92.952	200
80 30	06 04	50 47	03	03	09	0.000	00
80 30	05 02	40 43	03	01	09	145.281	220
80 30	09 04	54 01	03	03	-	Inaccessible	
80 30	07 03	43 31	03	03	-	Inaccessible	
80 30	11 03	31 54	03	02	09	384.508	135
80 30	14 03	10 01	03	02	09	197.543	195
80 30	13 04	27 35	03	02	09	400.004	105
80 30	05 06	28 16	03	13	00	0.000	00

Contents

1			2	3	4	5	6
80	06	56	03	03	09	144.200	120
30	06	04					
80	08	30	03	02	-	Inaccessible	
30	05	18					
80	11	26	03	02	-	Inaccessible	
30	06	35					
80	13	43	03	02	09	354.615	205
30	06	49					
80	13	52	03	02	09	46.725	75
30	05	45					
80	07	00	03	02	-	Inaccessible	
30	07	49					
80	11	31	03	03	09	25.631	20
30	07	35					
80	14	50	03	02	-	Inaccessible	
30	10	53					
80	12	39	03	03	-	Inaccessible	
30	12	45					
			Map sheet No. 52 B/8				
80	15	05	03	02	-	Inaccessible	
30	01	10					
80	17	27	03	03	-	Inaccessible	
30	01	18					
80	20	15	03	03	09	58.151	30
30	00	43					
80	23	38	03	03	-	Inaccessible	
30	01	37					
80	23	56	03	03	-	Inaccessible	
30	00	10					
80	26	16	03	03	-	Inaccessible	
30	02	18					
80	16	50	03	07	06	0.000	00
30	03	17					
80	20	22	03	02	09	Inaccessible	
30	04	27					
80	22	14	03	02	09	200.182	190
30	03	05					
80	23	38	03	03	-	Inaccessible	
30	04	26					
80	23	58	03	02	09	84.236	240
30	03	05					
80	26	56	03	03	-	Inaccessible	
30	02	46					
80	27	13	03	03	-	Inaccessible	
30	02	37					
80	45	17	03	02	09	82.020	95
30	07	20					
80	20	33	03	02	09	81.029	73
30	06	17					

Contents

1			2	3	4	5	6
80 30	16 08	47 13	03	02	-	Inaccessible	
80 30	20 08	34 30	03	03	-	Inaccessible	
80 30	17 10	12 13	03	02	-	Inaccessible	
80 30	18 11	57 47	03	03	-	Inaccessible	
80 30	18 10	38 38	03	03	-	Inaccessible	
80 30	16 13	19 14	03	03	-	Inaccessible	
			Map sheet No. 62 B/12				
Location of 11 points not available.			02	-	-	Inaccessible	
			02	-	-	Inaccessible	
			02	02	08	98.481	160
			02	03	-	Inaccessible	
			02	03	-	Inaccessible	
			02	02	09	331.510	20
			02	02	09	Inaccessible	
			02	02	07	Inaccessible	
			02	03	-	Inaccessible	
			02	-	-	Inaccessible	
			02	02	09	Inaccessible	
			Map sheet No. 62 C/1				
80 29	00 45	26 30	03	13	00	0.000	00
80 29	04 46	08 06	03	01	06	99.886	165
80 29	03 46	28 16	03	01	06	85.346	110
80 29	06 45	50 13	03	01	06	13.560	25
80 29	29 47	08 20	03	01	06	116.324	50

Contents

1			2	3	4	5	6
80	10	20	03	01	06	84.824	45
29	46	56					
80	12	15	03	01	06	144.517	200
29	45	27					
80	12	42	02	01	09	28.448	50
29	46	02					
80	14	51	02	01	09	52.208	305
29	46	24					
80	12	56	02	01	09	178.437	235
29	48	06					
80	14	39	02	01	09	70.263	65
29	49	23					
80	01	55	03	01	09	10.844	45
29	52	14					
80	03	08	03	01	08	85.080	280
29	52	05					
80	07	36	03	12	00	0.000	00
29	50	32					
80	09	26	03	01	06	144.694	135
29	51	25					
80	14	14	02	01	06	43.981	50
29	51	01					
80	13	20	02	01	08	-	-
29	51	26					
80	01	26	03	12	00	0.000	00
29	52	40					
80	03	02	03	03	06	24.019	05
29	52	43					
80	07	18	03	01	09	-	-
29	54	06					
80	05	21	03	01	09	44.892	110
29	53	29					
80	09	39	03	01	-	Inaccessible	
29	54	00					
80	07	57	03	01	06	60.384	45
29	53	30					
80	10	14	02	01	06	9.320	30
29	53	28					
80	13	02	02	01	08	50.182	170
29	53	38					
80	00	40	03	12		140.057	270
29	56	46					
80	09	35	03	03	20	22.109	85
29	55	49					
80	12	16	03	13	00	0.000	00
29	55	02					
80	13	37	02	03	06	3.571	15
29	55	13					

Contents

1			2	3	4	5	6
80	05	36	03	02	09	26.310	195
29	59	56					
80	12	08	03	03	09	0.000	00
29	57	35					
80	10	24	03	01	09	211.285	355
29	59	57					
80	12	46	03	11	-	Inaccessible	
29	59	54					
80	14	50	03	03	20	6.108	15
29	57	34					
			Map sheet No. 62 C/2				
80	05	40	03	01	20	6.983	30
29	31	23					
80	06	49	02	12	00	0.000	00
29	31	06					
80	07	14	02	01	06	94.376	70
29	31	14					
80	11	15	02	01	-	Inaccessible	
29	31	07					
80	11	15	02	01	08	67.515	270
29	31	22					
80	14	46	02	03	09	4.321	25
29	31	39					
80	12	47	02	01	09	308.933	565
29	30	46					
80	00	06	03	01	-	Inaccessible	
29	34	47					
80	03	49	03	03	11	13.020	70
29	32	56					
80	08	36	02	04	00	0.000	00
29	34	17					
80	01	18	03	01	06	148.850	55
29	37	13					
80	04	31	03	01	09	32.640	140
29	36	40					
80	07	27	02	03	06	0.000	00
29	35	15					
80	00	56	03	01	20	73.809	160
29	38	26					
80	03	34	03	12	00	0.000	00
29	38	04					
80	07	21	03	03	20	-	-
29	37	34					
80	09	22	02	01	08	-	-
29	39	11					
80	02	02	03	01	06	37.22	
29	41	30					

Contents

1			2	3	4	5	6
80 29	00 40	28 58	03	03	09	4.991	30
80 29	03 42	59 10	03	01	06	133.748	85
80 29	06 40	50 55	03	01	06	118.606	35
80 29	07 41	41 34	03	01	20	-	-
80 29	04 43	34 16	03	03	06	59.496	20
80 29	06 43	28 42	03	01	06	86.395	50
80 29	06 43	05 51	03	03	06	7.061	05
80 29	09 44	14 51	02	01	06	139.065	110
80 29	08 42	22 42	02	01	06	-	-
80 29	13 44	14 43	02	01	06	74.747	95
80 29	14 42	22 48	02	-	-	Inaccessible	

Map sheet No. 62 C/3

02	01	08	132.113	130
02	01	20	118.656	200
02	01	20	136.817	225
02	12	00	0.000	00
02	01	-	Inaccessible	
02	01	09	68.132	170
02	12	00	0.000	00
02	01	06	99.529	75
02	01	20	34.675	105
02	12	00	0.000	00
02	01	20	8.689	30
02	01	09	88.087	70

Contents

1			2	3	4	5	6
Location of 29 points not available.			02	12	00	0.000	00
			02	01	09	95.492	145
			02	01	09	75.327	195
			02	01	09	105.320	105
			02	01	20	20.847	55
			02	01	11	65.316	270
			02	01	08	30.315	25
			02	01	09	191.342	125
			02	01	09	138.909	120
			02	01	09	83.014	205
			02	01	08	119.987	60
			02	01	06	44.398	45
			02	01	06	9.108	70
			02	01	08	16.483	20
			02	01	20	-	-
			02	01	20	49.099	65
			02	01	20	65.378	220
			Map sheet No. 62 C/4				
80 29	01 06	33 39	05	01	-	Inaccessible	
80 29	00 05	54 49	05	03	17	14.271	50
80 29	03 06	20 02	05	01	-	Inaccessible	
80 29	04 05	12 26	05	01	20	143.952	195
80 29	02 09	30 27	05	01	20	70.365	65
80 29	00 08	03 02	05	01	20	183.914	295

Contents

1			2	3	4	5	6
80	03	06	05	01	20	104.083	195
29	08	20					
80	03	54	05	01	20	130.221	125
29	09	07					
80	06	16	05	01	-	Inaccessible	
29	08	34					
80	06	13	02	01	20	51.133	73
29	08	46					
80	08	00	05	01	20	254.692	135
29	07	35					
80	09	33	05	01	20	-	-
29	09	49					
80	11	02	05	01	20	503.523	95
29	08	33					
80	11	26	05	01	20	127.880	115
29	08	48					
80	14	14	05	01	-	Inaccessible	
29	09	39					
80	13	15	05	01	20	329.092	170
29	07	45					
80	01	30	02	01	20	-	-
29	11	39					
80	11	00	02	01	20	63.040	190
29	10	52					
80	04	09	02	12	00	0.000	00
29	10	22					
80	06	03	02	01	20	141.471	215
29	11	36					
80	06	24	02	01	11	228.867	180
29	10	45					
80	08	10	02	01	20	141.544	160
29	11	45					
80	09	18	02	01	06	96.474	45
29	10	45					
80	11	40	02	01	20	299.217	200
29	12	10					
80	10	51	05	01	20	167.829	195
29	10	21					
80	14	24	02	01	20	180.127	250
29	11	04					
80	13	15	02	01	20	79.617	135
29	11	29					
80	00	15	02	03	20	0.000	00
29	14	17					
80	02	15	02	01	11	140.305	270
29	13	17					
80	04	35	02	01	11	136.604	300
29	13	36					

Contents

1			2	3	4	5	6
80 29	02 13	53 56	02	01	20	11.699	20
80 29	07 13	14 39	02	01	20	81.260	250
80 29	05 13	19 53	02	01	20	26.004	85
80 29	09 14	56 03	02	01	20	27.929	80
80 29	07 13	33 27	02	01	20	58.993	235
80 29	11 14	01 39	02	01	09	109.731	140
80 29	11 12	29 51	02	12	00	0.000	00
80 29	14 14	26 21	02	01	20	112.498	155
80 29	13 13	00 12	02	01	11	138.627	135
			Map sheet No. 62 C/5				
80 29	15 45	27 11	02	03	09	1.693	10
80 29	17 47	02 19	02	02	09	81.285	80
80 29	19 45	06 43	02	02	06	90.187	35
80 29	23 46	22 50	02	02	20	3813.887	180
80 29	16 47	34 41	02	02	20	125.032	345
80 29	18 49	17 28	02	02	20	55.712	80
80 29	19 48	15 05	02	02	06	-	-
80 29	21 48	18 52	02	02	06	224.974	80
80 29	21 48	04 41	02	02	06	0.000	00
80 29	18 51	32 54	02	03	-	Inaccessible	
80 29	19 50	00 32	02	02	09	114.876	175
80 29	22 50	24 30	02	03	20	18.466	45
80 29	23 50	18 32	02	03	20	41.132	75
80 29	24 51	15 59	02	01	-	Inacces-sible	

Contents

1			2	3	4	5	6
80	25	54	02	02	09	112.187	80
29	51	13					
80	26	32	02	02	09	139.303	165
29	51	19					
80	28	51	02	02	09	65.727	95
29	50	47					
80	17	18	02	02	06	Inaccessible	
29	54	58					
80	19	27	02	02	20	37.239	135
29	53	42					
80	18	06	02	02	06	Inaccessible	
29	53	47					
80	20	51	02	02	09	157.425	165
29	53	49					
80	21	34	02	02	09	248.308	120
29	53	38					
80	24	36	02	02	09	136.685	45
29	52	44					
80	22	55	02	02	09	91.734	95
29	54	46					
80	26	47	02	02	-	Inaccessible	
29	53	19					
80	25	38	02	02	09	154.409	35
29	54	11					
80	18	13	03	02	20	105.407	380
29	57	14					
80	19	23	02	02	06	118.226	50
29	55	14					
80	20	57	02	10	00	0.000	00
29	56	14					
80	21	30	02	02	09	93.205	45
29	56	14					
80	22	51	03	01	-	Inaccessible	
29	57	29					
80	24	42	02	02	-	Inaccessible	
29	55	03					
80	25	34	02	02	-	Inaccessible	
29	56	09					
80	16	22	03	02	09	161.596	255
29	58	04					
80	16	08	03	02	09	Inaccessible	
29	59	28					
80	17	54	03	02	09	160.990	200
29	58	58					
80	19	55	02	14	00	0.000	00
29	58	33					
80	21	14	03	02		Inaccessible	
29	58	04					
80	21	10	03	02	-	Inaccessible	
29	59	27					

Contents

1			2	3	4	5	6
80 29	22 58	55 01	03	01	-	Inaccessible	
80 29	29 58	41 24	02	03	-	Inaccessible	

Map sheet No. 62 C/6

Location of 20 points not available.	02	03	09	8.148	10
	02	01	20	107.341	275
	02	01	09	27.550	145
	02	01	06	45.184	40
	02	01	09	70.977	325
	02	03	09	5.923	60
	02	01	00	0.000	00
	02	03	09	0.334	05
	02	03	06	0.000	00
	02	03	08	11.311	35
	02	03	20	0.000	00
	02	04	00	0.000	00
	02	03	06	42.376	25
	02	04	00	0.000	00
	02	03	20	0.832	10
	02	03	06	3.195	05
	02	01	-	Inaccessible	
	02	01	06	4.250	20
	02	03	06	-	-
	02	12	00	0.000	00

Contents

1			2	3	4	5	6
			Map sheet No. 62 C/7				
Location of 9 points not available.			02	01	06	94.852	50
			02	04	00	0.000	00
			02	01	06	80.289	20
			02	03	06	11.956	05
			02	01	06	46.742	25
			02	01	20	24.480	105
			02	03	20	35.261	05
			02	01	08	56.137	150
			02	01	08	76.258	135
			Map sheet No. 62 C/8				
80	15	38	05	01	20	107.505	245
29	09	16					
80	15	41	02	01	-	Inaccessible	
29	13	31					
80	16	54	02	01	06	-	-
29	14	02					
			Map sheet No. 62 C/9				
80	30	31	02	02	09	34.062	115
29	54	08					
80	31	58	02	02	09	215.513	305
29	53	22					
80	31	57	02	01	09	84.820	55
29	55	48					
80	33	18	02	01	09	187.572	45
29	57	02					
80	31	22	02	01	09	458.213	115
29	57	47					
80	36	28	02	02	09	242.148	110
29	59	36					

Total:- 313 Points

Contents

District : Nainital

Map sheet coverage : 53 K/15
53 O/2,3,4,7,6,8,10,11,12,15,16
53 P/9,13
62 C/4 62 D/1,2 (17 sheets)

Longitude E and Latitude N of plot centre			Forest Division code*	Land use code*	Forest type code*	Vol (m^3) per ha.	No. of trees per ha.
Degree	Minute	Second					
1			2	3	4	5	6
			Map sheet No. 53 K/15				
78 29	34 17	50 20	08	01	17	60.453	235
78 29	54 22	27 25	08	01	20	53.542	110
78 29	55 21	52 40	08	01	11	258.191	160
78 34	56 29	34 20	08	01	11	114.313	80
78 29	59 21	33 19	08	01	20	66.102	260
78 29	57 21	00 10	08	01	11	282.750	85
78 29	54 23	41 06	08	01	20	100.558	295
78 29	55 24	55 58	08	01	20	97.839	75
78 29	56 22	33 32	08	03	11	59.209	15
78 29	58 23	02 10	08	01	1 1	204.433	110
78 29	59 24	29 21	08	01	20	69.818	40
			Map sheet No 53 O/2				
79 29	07 32	34 22	08	01	20	155.457	270
79 29	09 30	51 03	08	01	20	183.067	75
79 29	11 30	24 22	08	01	20	46.359	85
79 29	13 30	37 09	08	01	-	Inaccessible	

Contents

1			2	3	4	5	6
79	00	51	08	01	20	108.574	130
29	34	08					
79	04	16	08	01	20	210.822	225
29	33	54					
79	03	18	08	01	20	207.680	260
29	33	37					

Map sheet No. 53 O/3

79	03	54	08	01	20	51.186	180
29	16	49					
79	06	52	08	01	20	11.572	140
29	16	10					
79	11	14	08	01	20	6.795	65
29	16	00					
79	11	15	08	01	20	84.063	280
29	16	28					
79	14	43	08	01	10	64.993	180
29	16	47					
79	12	47	08	01	20	0.000	00
29	15	41					
79	02	25	08	01	20	44.821	135
29	19	16					
79	03	45	08	01	20	54.934	130
29	17	58					
79	06	34	08	01	17	36.500	130
29	17	45					
79	05	59	08	04	00	0.000	00
29	19	44					
79	08	45	08	01	20	0.000	00
29	18	21					
79	08	45	08	01	20	0.000	00
29	19	08					
79	12	05	08	01	20	212.003	160
29	19	31					
79	10	26	08	01	17	31.848	155
29	17	57					
79	13	00	08	01	20	74.998	40
29	18	55					
79	01	08	08	03	20	10.969	35
29	20	19					
79	01	25	08	03	17	11.169	45
29	22	08					
79	07	25	08	01	17	1.851	30
29	20	13					
79	09	19	08	01	11	80.335	265
29	21	54					

Contents

1			2	3	4	5	6
79	11	12	08	01	10	140.765	15
29	22	08					
79	11	17	08	01	20	27.224	280
29	20	19					
79	13	54	08	01	11	171.792	145
29	20	06					
79	13	37	08	01	20	64.000	65
29	22	45					
79	00	50	08	01	20	3.507	10
29	23	29					
79	03	26	08	03	20	73.272	60
29	23	05					
79	04	07	08	17	00	0.000	00
29	24	26					
79	07	18	08	01	10	15.679	135
29	24	26					
79	09	19	08	01	20	184.676	125
29	24	15					
79	08	11	08	03	17	1.564	05
29	23	11					
79	10	24	08	01	20	233.815	170
29	24	41					
79	12	07	08	01	20	221.211	120
29	22	49					
79	14	12	08	01	10	28.638	05
29	24	42					
79	13	18	08	01	20	152.642	185
29	22	45					
79	05	40	08	01	20	172.550	155
29	26	32					
79	09	49	08	01	20	192.785	170
29	26	14					
79	07	44	08	01	10	131.293	155
29	25	55					
79	11	06	08	01	11	228.621	170
29	25	41					
79	11	25	08	01	11	268.957	160
29	25	49					
79	19	21	08	01	20	163.711	180
29	25	26					
79	18	11	08	01	20	16.183	30
29	27	05					
79	06	26	08	01	20	-	-
29	28	41					
79	06	06	08	01	-	Inaccessible	
29	28	50					
79	05	56	08	01	20	75.558	[illegible]
29	29	50					

Contents

1			2	3	4	5	6
79	08	35	08	01	20	157.231	110
29	27	40					
79	10	11	08	01	20	86.947	130
29	27	32					
79	12	20	08	-	-	Inaccessible	
29	29	55					
79	13	06	08	01	11	208.390	175
29	29	44					
79	14	25	08	01	20	34.648	45
29	27	49					
			Map sheet No. 53 O/4				
79	04	21	08	01	17	70.608	70
29	14	41					
79	13	52	08	01	20	70.777	220
29	14	41					
			Map sheet No. 53 O/6				
79	16	58	01	02	06	Inaccessible	
29	32	20					
79	15	34	01	02	09	0.000	00
29	30	08					
79	18	49	01	02	09	0.000	00
29	30	44					
79	18	38	01	02	09	Inaccessible	
29	31	36					
79	20	40	01	02	08	0.000	00
29	31	48					
79	23	36	01	02	06	0.000	00
29	30	50					
79	17	25	01	03	20	Inaccessible	
29	34	36					
79	17	58	01	03	-	Inaccessible	
29	34	34					
79	19	28	01	03	20	-	-
29	32	56					
			Map sheet No. 53 O/7				
79	15	19	08	01	10	60.285	145
29	15	54					
79	21	33	08	01	17	4.877	10
29	15	39					
79	22	48	08	01	17	90.905	260
29	17	11					
79	24	40	08	01	20	107.998	150
29	15	18					
79	27	26	08	01	11	-	-
29	16	28					
79	28	57	08	01	20	10.701	45
29	16	28					

Contents

1			2	3	4	5	6
79	28	35	08	01	20	119.686	125
29	15	57					
79	15	15	08	12	00	0.000	00
29	18	06					
79	17	19	08	01	11	271.542	170
29	19	22					
79	18	48	08	01	11	209.814	175
29	19	14					
79	18	44	08	01	11	216.208	155
29	18	14					
79	21	26	08	01	11	146.785	190
29	19	40					
79	21	05	08	01	20	80.955	130
29	17	49					
79	23	55	08	-	-	Inaccessible	
29	19	19					
79	23	19	08	01	20	7.125	05
29	18	07					
79	25	52	08	01	20	160.932	135
29	17	52					
79	17	26	08	01	11	226.711	65
29	21	29					
79	15	04	08	01	11	123.723	175
29	20	58					
79	17	41	08	01	11	165.907	115
29	20	38					
79	19	49	08	01	20	42.563	55
29	21	52					
79	22	19	08	12	00	0.000	00
29	22	27					
79	20	11	08	01	20	113.099	170
29	20	02					
79	16	18	08	01	11	203.201	120
29	24	57					
79	19	38	08	01	11	196.657	160
29	23	54					
79	20	28	08	01	20	122.261	105
29	23	01					
79	16	27	08	01	11	224.064	215
29	25	03					
79	17	47	08	01	11	195.861	120
29	25	20					
79	21	08	01	-	-	Inaccessible	
29	26	48					
79	28	46	01	02	09	Inaccessible	
29	18	23					
79	28	46	01	02	20	0.000	
29	19	03					

Contents

1			2	3	4	5	6
79	23	27	01	02	20	0.000	00
29	20	38					
79	23	51	01	02	08	Inaccessile	
29	21	49					
79	26	27	01	02	06	0.000	00
29	22	22					
79	26	05	01	13	00	0.000	00
29	20	05					
79	29	27	01	13	00	0.000	00
29	23	02					
79	23	42	01	02	20	0.000	00
29	23	26					
79	26	21	01	03	08	Inaccessible	
29	23	51					
79	26	09	01	01	09	Inaccessible	
29	23	38					
79	27	47	01	15	00	0.000	00
29	23	30					
79	29	43	01	02	06	0.000	00
29	23	59					
79	25	43	01	02	09	77.264	130
29	26	01					
79	26	49	01	02	06	Inaccessible	
29	26	30					
79	28	01	01	03	20	Inaccessible	
29	26	14					
79	29	40	01	03	06	Inaccessible	
29	26	07					
79	19	32	01	02	09	117.403	215
29	29	49					
79	22	10	01	02	09	151.189	280
29	29	58					
79	23	11	01	03	09	Inaccessible	
29	27	55					
79	24	19	01	02	09	138.902	370
29	29	34					
79	28	59	01	02	-	Inaccessible	
29	28	38					

Map sheet No. 53 O/8

79	22	05	49	01	20	0.692	05
29	04	28					
79	23	56	49	01	20	31.946	110
29	04	04					
79	26	07	49	01	20	35.345	70
29	04	04					
79	23	07	49	01	20	128.567	240
29	05	17					

Contents

1			2	3	4	5	6
79	24	29	49	01	20	131.540	250
29	07	08					
79	25	08	49	01	20	30.078	220
29	05	43					
79	27	26	49	01	17	3.369	55
29	06	40					
79	28	39	49	01	10	0.000	00
29	07	06					
79	17	30	49	01	20	0.000	00
29	09	29					
79	18	26	49	01	00	0.000	00
29	09	35					
79	21	51	49	03	20	6.485	15
29	07	45					
79	20	39	49	01	20	30.772	210
29	07	48					
79	24	54	49	01	17	92.760	250
29	08	37					
79	22	40	49	01	20	64.796	485
29	08	57					
79	26	50	49	01	20	40.086	315
29	09	48					
79	25	41	49	01	20	21.425	140
29	07	44					
79	28	47	49	01	17	32.453	30
29	08	57					
79	16	47	49	03	20	16.238	05
29	12	06					
79	19	41	49	01	17	37.458	160
29	10	29					
79	17	53	49	01	20	0.000	00
29	12	04					
79	21	06	49	01	20	105.185	158
29	10	52					
79	21	19	49	01	20	165.645	250
29	11	36					
79	23	19	49	01	20	124.108	10
29	10	58					
79	24	14	49	01	10	44.310	220
29	11	30					
79	27	17	49	01	20	3.514	15
29	11	12					
79	25	16	49	01	20	56.944	005
29	11	18					
79	15	41	48	03	20	0.000	00
29	14	42					

Contents

1			2	3	4	5	6
79	16	49	49	01	20	117.815	460
29	12	55					
79	17	45	49	01	20	0.000	00
29	14	02					
79	21	14	49	01	20	96.577	110
29	13	46					
79	23	02	08	01	20	97.652	220
29	14	36					
			Map sheet No. 53 0/10				
79	36	55	01	01	06	29.536	45
29	32	05					
79	35	37	01	01	06	148.600	75
29	30	25					
79	38	32	01	01	20	46.027	295
29	30	24					
			Map sheet No. 53 0/11				
79	31	01	01	01	08	157.461	275
29	17	16					
79	31	26	01	01	20	171.482	55
29	15	01					
79	34	25	01	01	11	245.572	130
29	15	28					
79	35	14	01	01	11	341.984	160
29	17	18					
79	32	22	01	01	20	42.681	70
29	18	48					
79	35	14	01	01	-	Inaccessible	
29	17	18					
79	36	34	01	03	20	7.823	30
29	18	49					
79	39	53	01	11	00	0.000	00
29	19	45					
79	43	52	01	14	00	0.000	00
29	19	50					
79	31	38	01	01	20	109.170	50
29	21	10					
79	30	50	01	03	20	49.349	05
29	21	22					
79	37	06	01	01	06	68.528	140
29	20	27					
79	39	28	01	01	09	138.474	300
29	20	24					
79	38	05	01	01	09	51.944	155
29	22	02					
79	40	11	01	01	09	-	-
29	21	24					

Contents

1			2	3	4	5	6
79	43	28	01	01	-	Inaccessible	
29	21	47					
79	44	03	01	01	09	94.097	185
29	20	40					
79	31	30	01	01	06	103.912	170
29	24	17					
79	33	30	01	01	08	183.064	325
29	23	16					
79	34	02	01	01	09	83.442	475
29	24	17					
79	36	54	01	01	06	48.341	155
29	23	22					
79	35	34	01	01	06	69.979	150
29	24	10					
79	38	00	01	04	00	0.000	00
29	22	56					
79	31	12	01	01	08	116.757	50
29	25	35					
79	31	17	01	12	000	0.000	00
29	26	54					
79	34	07	01	01	09	46.165	110
29	26	43					
79	36	32	01	12	00	0.000	00
29	25	36					
79	41	39	01	01	06	107.238	405
29	26	50					
79	40	33	01	14	00	0.000	00
29	25	56					
79	43	48	01	01	06	185.548	295
29	27	06					
79	44	24	01	01	-	Inaccessible	
29	26	06					
79	32	09	01	03	06	39.901	25
29	28	19					
79	30	22	01	01	09	119.193	100
29	29	14					
79	34	53	01	01	09	126.594	180
29	28	35					
79	32	39	01	03	09	31.292	50
29	28	54					
79	35	44	01	12	00	0.000	00
29	27	56					
79	36	45	01	03	06	8.381	55
29	29	36					
79	38	42	01	01	09	87.338	280
29	29	15					

Contents

1			2	3	4	5	6
79	38	51	01	15	00	0.000	00
29	28	17					
79	44	17	01	01	-	Inaccessible	
29	29	10					
79	37	14	01	02	08	0.000	00
29	15	14					
79	38	02	01	01	20	Inaccessible	
29	15	37					
79	41	25	01	01	08	0.000	00
29	16	18					
79	41	00	01	01	-	Inaccessible	
29	16	07					
79	43	38	01	12	00	0.000	00
29	15	49					
79	42	08	01	01	06	0.000	00
29	19	26					
79	43	41	01	01	20	-	-
29	17	40					
79	42	37	01	01	-	Inaccessible	
29	21	03					
			Map sheet No. 53 O/12				
79	31	17	06	12	00	0.000	00
29	01	44					
79	36	59	06	12	00	0.000	00
29	00	10					
79	44	12	49	01	20	162.282	140
29	02	13					
79	31	22	06	01	17	34.743	30
29	03	26					
79	31	06	06	15	00	0.000	00
29	04	00					
79	33	58	06	01	20	80.896	80
29	03	26					
79	33	38	06	01	20	134.592	85
29	04	04					
79	37	21	06	03	20	4.024	15
29	04	47					
79	38	40	06	03	20	0.000	00
29	04	50					
79	42	13	06	01	20	17.010	15
29	03	24					
79	43	35	06	01	20	41.479	330
29	03	17					
79	43	58	06	01	20	187.516	360
29	04	18					

Contents

1			2	3	4	5	6
79	33	54	06	03	20	10.111	30
29	07	10					
79	37	22	06	01	20	302.139	260
29	06	29					
79	35	05	06	01	20	47.583	45
29	06	00					
79	39	36	06	03	20	0.000	00
29	05	43					
79	37	51	06	01	20	186.846	150
29	06	46					
79	40	46	06	01	20	26.284	40
29	05	23					
79	43	02	05	01	20	123.272	185
29	07	10					
79	44	30	05	01	10	117.552	70
29	05	20					
79	33	22	06	01	20	86.888	85
29	07	51					
79	34	04	06	03	20	0.000	00
29	09	43					
79	36	20	06	12	00	0.000	00
29	08	41					
79	39	10	06	01	20	88.098	115
29	07	36					
79	38	22	05	01	20	179.171	200
29	09	53					
79	41	44	06	01	20	289.526	190
29	08	57					
79	40	42	05	01	10	195.403	295
29	08	28					
79	43	30	05	01	-	Inaccessible	
29	09	58					
79	44	05	05	01	20	142.455	130
29	07	30					
79	30	17	49	01	20	97.955	35
29	10	38					
79	32	10	06	01	20	82.576	100
29	10	06					
79	34	38	05	03	20	23.073	10
29	12	25					
79	36	41	05	01	20	67.554	75
29	11	20					
79	38	39	05	01	20	83.271	80
29	10	24					
79	38	53	05	01	20	30.420	105
29	12	06					

Contents

1			2	3	4	5	6
79 29	42 11	06 01	05	01	20	143.553	80
79 29	40 11	22 26	06	01	20	Inaccessible	
79 29	43 12	25 05	05	03	20	-	-
79 29	44 10	09 26	05	01	20	258.123	280
79 29	36 13	13 34	01	01	11	193.678	175
79 29	36 13	13 52	01	01	20	209.728	140
79 29	39 12	42 43	08	01	11	207.158	215
79 29	37 14	47 46	01	01	20	-	-
79 29	40 14	16 47	01	12	00	0.000	00
79 29	42 12	12 41	01	01	20	107.368	95
79 29	42 13	36 05	01	12	00	0.000	00
79 29	44 14	51 23	01	01	06	-	-
			Map sheet No. 53 O/15				
79 29	45 16	58 53	01	01	06	51.873	75
79 29	48 15	26 39	05	01	09	62.902	120
79 29	50 15	06 21	05	01	20	46.574	140
79 29	47 19	00 31	01	01	06	105.602	135
79 29	45 18	28 00	01	01	06	140.488	255
79 29	48 18	42 33	01	01	09	106.678	85
79 29	51 19	12 05	02	12	00	0.000	00
79 29	47 21	33 32	01	01	08	103.282	80
79 29	50 20	32 31	01	01	08	212.967	215
79 29	51 21	55 58	01	01	06	11.574	40
79 29	46 23	28 00	01	01	06	3.195	05

Contents

1			2	3	4	5	6
79	46	00	01	12	00	0.000	00
29	24	28					
79	48	12	01	12	00	0.000	00
29	24	32					
79	49	17	01	01	06	124.156	60
29	22	53					
79	45	31	01	01	09	170.119	300
29	25	14					
79	49	14	01	01	08	47.019	140
29	25	25					
				Map sheet No. 53 O/16			
79	49	44	06	01	11	212.329	185
29	01	31					
79	50	15	06	01	20	241.311	110
29	00	18					
79	52	21	06	01	20	43.325	75
29	02	13					
79	52	58	06	01	11	150.701	155
29	01	28					
79	56	30	06	03	11	63.139	10
29	02	15					
79	56	00	06	12	00	0.000	00
29	00	16					
79	58	26	06	01	20	55.361	170
29	00	58					
79	59	08	06	01	20	53.123	75
29	01	32					
79	47	12	06	01	09	81.816	55
29	03	03					
79	45	22	06	03	09	18.422	30
29	04	03					
79	50	14	06	01	09	243.454	205
29	03	46					
79	52	20	05	01	20	267.610	265
29	04	19					
79	52	53	05	01	09	355.765	115
29	04	46					
79	54	44	06	01	11	221.553	90
29	02	42					
79	55	22	05	01	20	162.425	245
29	04	10					
79	57	10	06	01	10	18.838	25
29	03	26					
79	59	08	06	01	10	52.465	265
29	02	34					
79	47	23	05	01	20	220.020	105
29	07	19					

Contents

1			2	3	4	5	6
79 29	45 05	10 15	05	01	09	80.783	110
79 29	47 07	46 21	05	01	-	-	-
79 29	49 05	47 09	05	01	20	168.167	120
79 29	50 06	02 54	05	01	20	788.129	200
79 29	52 05	30 31	05	01	11	322.839	195
79 29	54 05	26 55	05	01	20	159.042	85
79 29	53 06	07 29	05	01	09	70.436	45
79 29	55 05	12 02	05	01	20	396.719	170
79 29	57 07	19 30	05	-	-	Inaccessible	
79 29	57 07	46 07	05	01	11	383.758	255
79 29	45 09	13 25	05	01	11	120.239	175
79 29	47 08	18 07	05	01	20	235.837	130
79 29	49 08	56 58	05	01	11	320.859	175
79 29	47 08	37 34	05	01	20	204.081	175
79 29	51 09	12 55	05	01	20	153.725	210
79 29	51 07	18 38	05	01	20	173.547	280
79 29	46 10	48 16	05	01	20	-	-
79 29	48 10	25 01	05	01	20	177.192	110
79 29	49 12	07 31	05	01	-	Inaccessible	
79 29	51 10	58 06	05	01	20	94.553	190
			Map sheet No. 53 O/16				
79 29	50 10	29 22	05	01	20	107.362	260
79 29	52 11	38 47	05	01	09	80.159	145

Contents

1			2	3	4	5	6
79	45	27	01	01	06	182.068	250
29	14	19					
79	48	22	01	03	20	8.613	25
29	12	42					
79	52	04	05	01	11	154.146	345
29	13	33					
79	54	01	02	01	09	164.408	235
29	14	45					
79	53	31	05	01	20	142.034	310
29	12	46					
			Map sheet No. 53 P/9				
79	39	49	06	02	11	336.691	40
28	56	51					
79	41	11	06	02	20	49.494	390
28	55	26					
79	36	45	06	03	20	269.544	15
28	59	42					
79	38	38	06	02	20	55.597	135
28	57	59					
			Map sheet No. 53 P/13				
79	58	43	47	04	00	0.000	00
28	46	11					
79	58	50	47	03	11	0.269	05
28	46	19					
79	54	55	47	02	20	24.614	235
28	47	39					
79	56	05	47	02	11	148.435	110
28	49	46					
79	56	22	47	07	20	0.000	00
28	47	46					
79	58	27	47	07	20	0.000	00
28	48	38					
79	59	03	47	02	11	121.093	145
28	48	50					
79	59	20	47	02	11	215.373	185
28	52	26					
79	58	14	47	07	20	1.240	10
28	50	06					
79	59	51	47	02	11	150.299	185
28	54	21					
79	59	40	47	02	11	286.449	135
28	55	10					
79	45	43	06	02	11	379.437	140
28	59	32					

Contents

1			2	3	4	5	6
			Map sheet No. 62 C/4				
80 29	02 00	43 35	05	01	17	93.128	310
80 29	04 01	45 51	05	01	11	331.986	80
80 29	07 01	01 21	05	17	-	Inaccessible	
80 29	05 01	30 07	05	12	00	0.000	00
80 29	00 04	23 03	05	01	20	65.882	140
80 29	02 03	06 27	05	01	20	125.435	425
80 29	02 03	44 16	05	01	20	161.854	200
80 29	04 04	47 08	05	01	11	0.000	00
80 29	06 04	24 09	05	14	00	0.000	00
80 29	06 03	06 21	05	14	00	00.000	00
80 29	06 06	51 59	05	01	20	90.506	205
80 29	05 05	37 34	05	01	20	248.284	275
80 29	08 07	57 00	05	01	20	58.249	105
80 29	00 00	06 17	05	02	20	0.000	00
80 29	02 01	22 44	05	02	17	0.000	00
			Map sheet No. 62 D/1				
80 28	01 46	54 30	47	01	11	277.459	315
80 28	01 46	54 18	47	01	11	329.090	255
80 28	02 46	54 35	47	03	11	81.921	125
80 28	02 47	06 54	47	16	-	Ina-ccessible	
80 28	00 49	18 10	47	02	11	94.817	75
80 28	00 50	46 08	47	02	11	80.255	130
80 28	01 52	45 10	47	10	00	0.000	00

Contents

1			2	3	4	5	6
80	03	38	47	02	20	214.392	200
28	51	15					
80	01	03	47	12	00	0.000	00
28	53	48					
80	02	34	47	07	20	38.794	135
28	54	36					
80	02	20	47	01	20	76.545	175
28	56	32					
80	00	11	47	12	00	0.000	00
28	55	59					
80	02	48	47	07	20	1.329	05
28	56	47					
80	00	05	47	13	00	0.000	00
28	59	07					
80	01	54	47	03	20	94.351	175
28	58	16					
80	03	51	47	03	17	28.434	40
28	58	00					
80	03	44	47	03	20	0.000	00
28	59	27					
80	05	49	47	02	20	156.197	200
28	59	12					
			Map sheet No. 62 D/2				
80	00	16	05	07	20	0.000	00
28	44	31					

Total:- 366 points

Contents

District : Dehradun

Map sheet coverage : 53 F/11,15,16
53 J/3,4,8 (6 sheets)

Longitude E and Latitude N of plot centre			Forest division code*	Land use code*	Forest type code*	Vol (m^3) per ha.	No. of trees per ha.
Degree	Minute	Second					
1			2	3	4	5	6
			Map sheet No. 53 F/11				
77	43	12	20	01	11	156.817	95
30	22	26					
77	44	23	18	01	11	140.620	245
30	20	08					
77	39	30	20	02	-	Inaccessible	
30	24	32					
77	41	13	20	01	11	263.253	170
30	24	28					
77	41	18	20	01	-	Inaccessible	
30	23	08					
77	44	04	20	01	11	214.840	210
30	23	36					
77	43	27	20	01	11	220.954	190
30	23	57					
			Map sheet No. 53 F/15				
77	51	34	20	01	-	Inaccessible	
30	16	02					
77	50	56	20	01	20	-	-
30	16	27					
77	53	15	20	01	11	140.935	165
30	16	53					
77	54	09	20	01	20	120.835	90
30	15	38					
77	56	39	20	01	11	236.043	195
30	15	08					
77	55	49	20	01	11	183.696	185
30	17	21					
77	59	56	20	03	11	0.000	00
30	15	46					
77	57	34	20	01	11	111.799	160
30	16	42					

Contents

1			2	3	4	5	6
77	47	09	20	01	11	75.200	25
30	19	37					
77	48	04	20	01	-	Inaccessible	
30	17	47					
77	49	32	20	01	11	45.371	45
30	19	45					
77	51	11	20	01	11	143.708	220
30	18	45					
77	51	19	20	01	11	129.434	200
30	18	45					
77	45	09	20	01	11	170.814	200
30	20	48					
77	47	22	20	01	20	70.049	170
30	21	42					
77	49	07	20	01	11	235.840	50
30	20	48					
77	55	04	20	01	20	70.970	100
30	20	49					
77	57	26	20	01	11	94.989	100
30	21	40					
77	58	49	20	12	00	0.000	00
30	21	17					
77	58	41	20	01	11	132.215	95
30	21	15					
77	49	52	20	01	11	297.241	95
30	23	54					
77	51	39	20	01	11	205.948	295
30	24	27					
77	53	21	20	03	11	0.000	00
30	23	02					
77	57	07	20	01	11	158.123	280
30	24	27					
77	55	22	20	01	11	353.240	125
30	23	02					
77	57	37	20	01	11	175.258	290
30	24	50					
77	59	52	20	01	11	222.612	165
30	22	36					
77	28	49	20	01	11	129.698	210
30	26	37					
77	55	43	20	01	11	140.930	150
30	27	00					
77	56	49	20	01	11	74.171	145
30	25	49					
77	57	31	20	01	11	156.209	360
30	25	46					

Contents

1			2	3	4	5	6
77 30	49 28	41 05	20	01	11	162.808	480
77 30	53 29	07 32	20	01	11	112.696	155
77 30	51 27	41 55	20	01	11	231.373	160
77 30	53 29	07 55	20	01	11	197.989	285
77 30	59 28	32 35	20	01	20	-	-
			Map sheet No. 53 F/16				
77 30	56 13	09 40	18	01	20	31.753	100
77 30	59 13	43 03	20	01	11	151.064	290
77 30	57 14	48 29	20	01	11	104.246	125
			Map sheet No. 53 J/3				
78 30	01 15	22 02	20	01	11	25.116	25
78 30	09 16	28 37	19	01	20	130.085	180
78 30	10 17	30 10	19	01	20	63.283	15
78 30	12 15	00 20	19	03	20	-	-
78 30	14 16	38 40	19	01	20	197.837	140
78 30	07 19	17 44	19	11	-	-	-
78 30	08 18	48 18	19	01	11	134.388	330
78 30	07 20	47 52	17	04	00	0.000	00
78 30	02 23	22 41	20	01	20	122.240	445
78 30	00 23	07 46	20	01	11	154.121	410
78 30	09 24	26 35	17	12	00	0.000	00
78 30	07 23	07 59	17	03	20	16.522	65
78 30	10 23	22 31	17	03	20	13.807	50

Contents

1			2	3	4	5	6
78	12	52	17	04	00	0.000	00
30	24	17					
78	01	17	20	01	11	106.324	555
30	25	18					
78	01	11	17	01	09	46.986	200
30	27	10					
78	02	39	20	01	11	25.739	140
30	25	11					
78	09	47	17	03	09	-	-
30	27	19					
78	05	36	17	03	09	11.400	45
30	25	41					
78	09	03	17	03	09	1.633	20
30	26	33					
78	07	39	17	03	09	8.835	25
30	27	42					
78	10	52	17	10	00	0.000	00
30	25	26					
78	13	11	17	03	09	11.204	75
30	25	10					
78	00	49	17	03	09	5.497	05
30	28	31					
78	02	47	17	01	09	55.392	165
30	28	04					
78	06	15	17	01	09	-	-
30	28	33					
			Map sheet No. 53 J/4				
78	07	18	19	01	11	164.754	175
30	01	33					
78	08	57	19	01	20	62.354	130
30	00	57					
78	08	22	19	01	11	117.220	195
30	01	30					
78	10	20	19	01	20	114.204	210
30	02	20					
78	12	35	19	15	00	0.000	00
30	00	59					
78	04	38	19	01	11	179.840	165
30	04	22					
78	06	25	19	01	20	192.827	175
30	04	11					
78	06	04	19	01	11	76.797	80
30	03	17					
78	08	54	19	01	20	67.792	140
30	04	39					

Contents

1			2	3	4	5	6
78	08	30	19	03	11	41.941	05
30	02	50					
78	10	53	19	01	20	77.048	180
30	03	11					
78	13	11	19	01	20	120.968	135
30	02	53					
78	14	08	19	12	00	0.000	00
30	04	36					
78	02	14	19	01	20	75.150	135
30	06	30					
78	02	42	19	01	11	61.233	90
30	06	31					
78	04	45	19	01	11	304.010	225
30	05	59					
78	05	11	19	01	20	98.683	60
30	05	36					
78	07	14	19	01	11	211.754	211
30	06	54					
78	09	53	19	01	20	31.038	60
30	06	07					
78	11	04	19	01	20	16.421	25
30	05	36					
78	11	25	19	01	11	172.042	165
30	06	51					
78	13	56	19	01	11	274.532	205
30	07	19					
78	13	32	19	01	20	100.052	195
30	05	10					
78	02	00	19	01	11	240.743	85
30	08	47					
78	03	52	19	01	11	242.895	400
30	07	28					
78	03	43	19	01	11	158.654	175
30	09	57					
78	05	18	19	01	20	2.804	25
30	08	34					
78	11	14	19	01	20	57.922	210
30	08	24					
78	13	48	19	01	11	239.111	200
30	08	50					
78	13	39	19	01	20	312.312	155
30	08	35					
78	01	27	19	01	11	215.988	240
30	11	05					
78	01	03	19	01	11	268.304	470
30	11	26					

Contents

1			2	3	4	5	6
78 30	04 10	03 07	19	01	11	144.501	145
78 30	03 12	24 27	19	12	00	0.000	00
78 30	07 12	05 14	19	01	11	345.028	210
78 30	14 11	14 39	19	01	20	0.000	00
78 30	00 14	06 52	20	01	11	237.818	265
78 30	02 12	24 38	19	01	11	325.557	250
78 30	04 13	25 04	19	01	11	196.417	140
78 30	03 14	02 26	19	01	11	216.202	150
78 30	05 12	15 40	19	01	11	265.842	185
78 30	09 14	49 57	19	01	11	57.265	70
78 30	07 12	35 33	19	01	11	240.692	215
78 30	10 12	42 58	19	01	11	277.924	105
78 30	11 14	47 36	19	01	11	206.168	205
78 30	14 13	21 56	19	01	20	46.395	65
78 30	13 13	04 38	19	01	11	126.759	75
			Map sheet No. 53 J/8				
78 30	17 06	16 50	19	15	00	0.000	00
78 30	16 05	18 39	19	01	20	33.776	80
78 30	15 14	54 54	19	01	20	-	-
78 30	24 14	14 07	18	01	11	196.113	205
			Total:-		123 Points		

Contents

Description of Codes for forest Division i.e. Col. 2 of Appendix II.

Code	Name of Forest Division
01	Nainital
02	Pithoragarh
03	East Almora
04	West Almora
05	Haldwani
06	East Terai
07	Kalagarh
08	Ram Nagar
09	Garhwal
10	Lansdowne
11	Kedarnath
12	Badrinath
13	Tehri
17	Yamuna
18	Shiwalik
19	East Dehradun
20	West Dehradun
47	North Pilibhit
48	West Terai
49	Central Terai

Contents

Description of codes for land use i.e. col. 3 of appendix II

Code	Item	Description
01	Dense tree forests	All lands with a forest cover of trees with canopy density 70% and above (canopy density is defined as the relative completeness of Canopy expressed as percentage taking closed Canopy as 100. Standing in a plot or in area around it observe the tree growth and assess the percentage of the space covered).
02	Moderately Dense-tree Forests.	All lands with a forest cover of trees. With Canopy density 30% to 69%.
03	Open tree Forests	All lands with a Forest cover of trees with Canopy density 5% to 29%
04	Scrub Forests	Inferior tree growth chiefly of small or stunted trees. With Canopy density less than 5%.
05	Bamboo brakes	Areas completely covered with Bamboo growth.
06	Shifting cultivation (Kumri)	Areas under current as well as last years shifting cultivation will come under this class. The agriculture crop may be standing or may have been harvested.
07	Young plantations of forestry species	This will include young plantations of forestry species in which average stems are above 10 cm. diameter at B.H. and the extent of such plantation is more than 0.5 ha. This will include Farm Forests, Social forestry plantations, Parts of coversion to uniform areas, plantations raised by Forest Development Corporation etc.
08	Trees in line	This will include trees planted along canal banks, along road sides, along railway lines, wind brakes and shelter belts planted under various Social Forestry Schemes.
09	Forest roads etc.	This class will include areas under forest roads, depots, colonies, nurseries and such other forest land used in connection with forest administration.
10	Govt. Grass lands	This will include areas under natural or planted grass lands pastures etc. which are owned by Government.
11	Barren lands	This will include areas with exposed surfaces like rock sheets, sand swamps and areas without any ve

Code	Item	Description
12	Agricultural land without trees in surround	All lands under cultivation including fallow lands will come under this category. These lands will not have any tree growth along bunds or in their vicinity of 2 ha.
13	Agricultural land with trees in surround	This will include all lands under cultivation including fallow lands which are covered with trees along bunds and in their surround within 2 ha.
14	Non forestry plantations	All lands with tree growth planted primarily for purposes other than forestry such as Cashew, Coffee, gardens, parks, zoos, private grass lands etc.
15	Habitation	This will include village City sites, industrial area, grave yards, grounds, houses, Colonies etc.
16	Water bodies	Land under lakes, water courses etc.
17	Other lands	Lands which cannot be classed under any of the above categories.

Contents

Description of codes for Forest type i.e. col. 4 of appendix II

Code	Crop composition (Forest type)	Description
01	Fir	When Fir constitute more than 50%
02	Spruce	Where Spruce constitute more than 50%
03	Fir-spruce	Where Fir & Spruce both taken together constitute more than 50%
04	Blue-pine (Kail)	Where Blue pine constitute more than 50%
05	Deodar	Where Deodar constitute more than 50%
06	Chir-pine	Where Chir-pine constitute more than 50%
07	Mixed conifers	Where all conifers taken together constitute more than 50%
08	Hardwoods mixed with conifers or Conifers mixed with hardwoods	Where the conifers & broad leaved species occur in more or less in same propositions
09	Up-land hardwoods	Broad leaved species constitute more than 50% in the Upper Chir zone above 1500 metre altitude.
10	Teak	Where Teak constitute more than 20%
11	Sal	Where Sal constitute more than 20% (If Sal and Teak are both more than 20% preference to be given to teak)
12	Bamboo forest	Where the crop is of almost pure bamboo.
13	Mangrove	Mangrove forests.
14	Depterocarpus (Gurjan)	Where Gurjan constitute more than 50% in the top canopy.
15	Hollong Mekai Hollong (Depterocarpus macro carpus) Shorea assamica (Mekai)	Where Hollong and Mekai individual or both taken together constitute more than 50%.
16	Khasi pine	Where Khasi pine constitute more than 50%
17	Khair forest	Where Khair trees constitute more than 50%
18	Salai forest	Where Salai constitute more than 50%.
19	Alpine pastures	Alpine pastures.
20	Miscellaneous forest	Forest which could not be classified in any of the above classes.

Contents

F. S. I.

Field. Form 1

PLOT APPROACH FORM

1) Plot Approach Form must be filled in while the journey is in progress.
2) While recording date, it is essential to record month and year also.
3) If a plot is visited on more than one day, a separate form for each visit shall be filled up.

1. State and Code

2. Division and Code

3. District and Code

4. Map-sheet and Code

5. Grid Code

5. (a) Plot No.

6. Crew Leader (name)

7. Name of Camp

8. Time (hrs.) at which Left the camp

9. Distance covered by vehicle (km.)

10. Time taken in journey by vehicle — Hours — Minutes

11. Name of the place up to which journey was performed by vehicle. (describe in brief)

12. Conspicuous features observed during the journey by vehicle (describe in brief)

13. Time at which started on foot

14. Direction and distance covered on foot up to the reference point (km.)

15. Conspicuous features observed during the journey on foot (describe in brief)

16. Time (hrs.) at which arrived at the reference point.

17. Description of the reference point (Describe in details)

18. Compass bearing from reference point to the plot approached for commencing survey (please give the Plot No. also) if any

19. Distance of the plot Centre from reference point (Mtr)

Contents

20.	Date and time at which arrived at the Plot	Ist Plot*	2nd Plot*
21.	Time (hrs) of Leaving the Plot	Ist Plot*	2nd Plot*
22	Time (hrs.) at which returned to the Camp.		
23.	Compassing done by		
24.	Distance measured by		
25.	Plots laid out by		
26.	Tree Enumeration done by		
27.	Height measurements taken by		
28.	B T and other measurements taken by		
29.	Bamboo enumeration done by		
30.	Bamboo Weight taken by		
31.	References in the field written by		
32.	Remarks		

Dated :

Signature of the Crew Leader

Diagrams etc.

A

B

N. B. *Strike out unwanted one.

Contents

PLOT DESCRIPTION FORM

Field Form 2

	Job No.	Card design	Zone	State	District	Forest Division	Map Sheet No.	Gird No.	Plot No.	Legal Status	Land Use
	1—3	4—5	6	7—8	9—10	11—12	13—18	19—22	23	24	25—26

Terrain Data						Soil Data							Crop Data												Bamboo Data				Plantation Potential	Distance to road	Distance to Mule Path	Distance to River/stream	Kacha road Distance	Pucca road Distance	River distance to market outlet	Obstacles	Plot Status	Status of Forest
General Topography	SLOPE	Position on Slope	Altitude	Aspect	Rockiness	Humus	Soil Colour	Soil Consistency	Soil Texture	Coarse Fragments	Soil Depth	Soil Erosion	Origin of Stand	Crop. Composition	Canopy Layer or Storey	Top Height	Size Class	Intensity of regeneration	Important Species under registration	Injuries to Crop	Fire Incidence	Grazing Incidence	Presence of weeds	Presence of Grass	Bamboo density	Bamboo quality	Bamboo Flowering	Bamboo regeneration										
27	28-30	31	32 35	36	37	38	39	40	41	42	43	44	45	46-47	48-49	50 51	52	53	54-56	57	58	59	60	61	62	63	64	65	66	67	68	69	70 71	72 74	75 76	77	78	79

Dated.....

Signature of Crew Leader.....

Name of crew Leader .....

PLOT ENUMERATION FORM

Field Form No..3

Job No.	Card design	Map Sheet No.	Grid No.	Plot No.
1—3	4—5	6—11	12—15	16

Total No. of bamboo clums	Total No. of trees
71—73	74—76

Species		Species		Species		Species		Species		Species		Species		Species		Species	
Code	Dia	Code	Dia	Code	Dia	Code	Dia	Code	Dia	Code	Dia	Code	Dia	Code	Dia	Code	Dia
17-19	20-22	23-25	26-28	29-31	32-34	35-37	38-40	41-43	44-46	47-49	50-52	53-55	56-58	59-61	62-64	65-67	68-70

Date .....

Signature of Crew Leader.....

Name of Crew Leader.....

Contents

Field Form No. 4

SAMPLE TREE FORM

Job No.	Card design	Map Sheet No.	Grid No.	Plot N .
1—3	4—5	6—11	12—15	16

Total No. of trees
55—56

SPECIES	Tree Serial No.	Species Code	Dominance	DBH OB (cm)	DBT (mm)	Tree Height (m)	Clear Bole (m)	Condition	Form: Longitudinal	Form: Sectional	SPECIES	Tree Serial No.	Species Code	Dominance	DBH OB (cm)	DBT (mm)	Tree Height (m)	Clear Bole (m)	Condition	Form: Longitudinal	Form: Sectional
	17-18	19-21	22	23-25	26-28	29-30	31-32	33	34	35		36-37	38-40	41	42-44	45-47	48-49	50-51	52	53	54

Date .....

Signature of Crew Leader.....

Name of Crew Leader.....

BAMBOO EMUNERATION AND CLUMP ANALYSIS FORM

Job No.	Card Design	Map Sheet No.	Grid No Inter Sectional No	Plot No
1—3	4-5	6—11	12—15	16

Average culm height (in dcm)		Bamboo quality
Upto 1cm top dia 72—74	Upto 2cm top dia 75—77	78

Species	Species Code	Clump Serial No.	Clump diameter (in cms.	Clump size class	Green sound culms							Green damaged culms							Dry sound culms			Dry damaged culms			Decayed culms	Total No. of culms
					Current year's	One to two seasons old			Over two seasons old			Current year's	One to two seasons old			Over two seasons old										
						2<5 Cms	5<8 Cms	8 + Cms	2<5 Cms	5<8 Cms	8 + Cms		2<5 Cms	5<8 Cms	8 + Cms	2<5 Cms	5<8 Cms	8 + Cms	2<5 Cms	5<8 Cms	8 + Cms	2<5 Cms	5<8 Cms	8 + Cms		
	17—19	20-22	23-25	26	27—28	29-30	31-32	33-34	35-36	37-38	39-40	41—42	43-44	45-46	47-48	49-50	51-52	53-54	55-56	57-58	59 60	61-62	63-64	65-66	67—68	69—71

Date ....

Signature of Crew Leader .....

Name of Crew Leader .....

Field Form 6

BAMBOO ENUMERATION FORM (NON CLUMP FORMING)

Job No.	Card Design	Map Sheet No.	Grid No.	Plot No.
1–3	4–5	6–11	12–15	16

Species Code	Green sound culms							Green damaged culms							Dry sound culms			Dry damaged culms			Decayed culms	Average culms Ht. (in decimeter)	Total No. of culms
	Current year's	One to two years old			Over two years old			Current year's	One to two year old			Over two years old											
		2<5 Cms	5<8 Cms	8 + Cms	2<5 Cms	5<8 Cms	8 + Cms		2<5 Cms	5<8 Cms	8 + Cms	2<5 Cms	5<8 Cms	8 + Cms	2<5 Cms	5<8 Cms	8 + Cms	2<5 Cms	5<8 Cms	8 + Cms			
17–19	20–22	23-25	26-28	29-30	31-33	34-36	37-38	39-41	42-44	45-47	48-49	50-52	53-55	56-57	58-60	61-62	63-6[illegible]	65-67	68-69	70-71	72-73	74-76	77-80

Date.....

Signature of the Crew Leader.....

Name of the Crew Leader .....

Contents

Job Number	Card Design
1-3	4-5

BAMBOO WEIGHT FORM

Map sheet Number	Grid No.	Plot Number
6-11	12-15	16

Field Form No. 7

Species Code	Sample No.	Green Weight of culm															Green weight of sub-sample for co-relation with dry weight		
		DIAMETER CLASS																	
		2 to under 5 cm					5 to under 8 cm					8 cm and over					Sub-sample culm 2cm & under 5cm dia	Sub-sample culm 5cm & under 8cm dia	Sub-sample culm 8cm and over
		Diameter in cm	Total length in dmt	Utilizable length in dmt		Weight in Grams	Diameter in cm	Total length in dmt	Utilizable length in dmt.		Weight in Grams	Diameter in cm	Total length in dmt.	Utilizable length In dmt		Weight in Grams			
				Upto 1cm top dia	Upto 2cm top dia				Upto 1cm top dia	Upto 2cm top dia				Upto 1cm top dia	Upto 2cm top dia				
17 18 19	20	21 22	23 24 25	26 27 28	29 30 31	32 33 34 35 36	37 38	39 40 41	42 43 44	45 46 47	48 49 50 51 52	53 54	55 56 57	58 59 60	61 62 63	64 65 66 67 69	69 70 71 72	73 74 75 76	77 78 79 80

Date ....

Signature of Crew Leader....................

Name of Crew Leader....................

Contents

HERBS AND SHRUBS DATA FORM

Field Form No. 8

Map Sheet No.....

Grid No.....

Plot No.....

HERBS								SHRUBS										
Name of Species	Total No.	Characteristics			Occurrence		Colour of flower if observed	Name of Spp	Total No.	Avr. Ht.	Pattern of Branching			Occurence		Information on flowers & Fruits	
		Erect	prostrate	Creeping	Grega-rious	Sporadic					Opposite	Alternate	Whorling	Grega-rious	Sporadic	Clour of Flowers	Size of fruit (Small med big)

Date.....

Signature of the Crew Leader.....

Name of the Crew Leader .....

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