MDMN

FOREST RESOURCES

OF

MANIPUR STATE

सत्यमेव जयते

FOREST SURVEY OF INDIA

CENTRAL ZONE

NAGPUR

1991

Contents

FOR OFFICIAL USE ONLY

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PREFACE

This report is prepared on the basis of data collected from Manipur State forests by carrying out ground inventory survey of the State. This task was taken up under a decision of the Central Government to carry out inventory work in north-eastern States. The inventory was conducted by the Central Zone of the Forest Survey of India in it's annual programme during the years 1986-87 and 1987-88. The work began in the month of November 1986 and continued till April 1988. The resources survey in Manipur was also carried out earlier by the Central Zone office under it's pre-investment survey programmes in the year 1976.

The Pre-investment Survey Of Forest Resources of Manipur State was a part of the intensification programme of forest survey in the north-eastern region of the country. The results of inventory conducted in the year 1976 showed total growing stock of timber in Manipur tree forest as 68077800 cu.m. with standard error of 10.4% and that in the open forest as 4333600 cu.m. with standard error of 43.3%. The total volume as per this survey works out to be 72411.4 (000) cu.m.

Under new perspective Forest Survey of India conducted this survey for storing data highlighting various parametres from forestry point of view. The total forest area of Manipur is 15,154 km^2 constituting 67.87% of 22,327 km^2 of geographical area. The survey results show that 74.33% forest area (11263.90 km^2) is vegetated area. The bamboo brakes spread over an area of 1591.93 km^2, constituting 14.13% of the vegetated area. According to the survey results, 198.38 km^2 constituting 1.76% is under conifers forests, 8348.28 km^2 constituting 74.12% is under low land hardwood, 1125.31 km^2 is under upland hardwood constituting about 9.99%. The total growing stock of the trees is 51604.73 (000) cu.m. and that of bamboo is 11470484 tonnes.

Both clump forming and non-clump forming bamboos are available in Manipur. Clump forming bamboos cover an area of 1813.644 km^2 and those of non-clump forming bamboos cover 1878.129 km^2. Regeneration of bamboo in both categories was found over an area of 499.759 km^2.

3691,773

The staff of the Central Zone deserve appreciation for their efforts in the preparation of the report.

I hope the report will be useful in planning of the forest management in Manipur State.

J.B.LAL
DIRECTOR
FOREST SURVEY OF INDIA
25- SUBHASH ROAD
D E H R A D U N

Contents

TABLE OF CONTENTS

Contents

C H A P T E R - I V

DATA PROCESSING

C H A P T E R - V

INVENTORY RESULTS : AREA

Contents

C H A P T E R - V I

INVENTORY RESULTS: GROWING STOCK

GROWING STOCK TABLES

Contents

	DISTT. CHURACHANDPUR	
6.06T(A) 6.06T(B)	Stems(000) Stems/ha	- Crop composition: Lowland hardwood -do-
6.07T(A) 6.07T(B)	Stems(000) Stems/ha	- Crop composition: Upland hardwood -do-
6.08T(A) 6.08T(B)	Stems(000) Stems/ha	- Crop composition: Bamboo brakes -do-
	DISTT. UKHRUL	
6.09T(A) 6.09T(B)	Stems(000) Stems/ha	- Crop composition: Conifers -do-
6.010T(A) 6.010T(B)	Stems(000) Stems/ha	- Crop composition: Lowland hardwood -do-
6.011T(A) 6.011T(B)	Stems(000) Stems/ha	- Crop composition: Upland hardwood -do-
	DISTT. TAMENGLONG	
6.012T(A) 6.012T(B)	Stems(000) Stems/ha	- Crop composition: Lowland hardwood -do-
6.013T(A) 6.013T(B)	Stems(000) Stems/ha	- Crop composition: Upland hardwood -do-
6.014T(A) 6.014T(B)	Stems(000) Stems/ha	- Crop composition: Bamboo brakes -do-
	DISTT. CHANDEL	
6.015T(A) 6.015T(B)	Stems(000) Stems/ha	- Crop composition: Conifers -do-
6.016T(A) 6.016T(B)	Stems(000) Stems/ha	- Crop composition: Lowland hardwood -do-
6.017T(A) 6.017T(B)	Stems(000) Stems/ha	- Crop composition: Upland hardwood -do-
6.018T(A) 6.018T(B)	Stems(000) Stems/ha	- Crop composition: Bamboo brakes -do-

ENTIRE STATE

6.019T(A)	Stems(000)	- Crop composition: Conifers
6.019T(B)	Stems/ha	-do-
6.020T(A)	Stems(000)	- Crop composition: Lowland hardwood
6.020T(B)	Stems/ha	-do-
6.021T(A)	Stems(000)	- Crop composition: Upland hardwood
6.021T(B)	Stems/ha	-do-
6.022T(A)	Stems(000)	- Crop composition: Bamboo brakes
6.022T(B)	Stems/ha	-do-
6.023T(A)	Stem(000)	- Crop composition: All combined
6.023T(B)	Stems/ha	-do-

DISTT. IMPHAL, THOUBAL AND BISHNUPUR

(Volume in cu.m.)

6.024T(A)	Volume(000)	- Crop composition: Lowland hardwood
6.024T(B)	Volume/ha	-do-
6.025(A)	Volume(000)	- Crop composition: Bamboo brakes
6.025(B)	Volume/ha	-do-

DISTT. SENAPATI

(Volume in cu.m.)

6.026T(A)	Volume(000)	- Crop composition: Conifers
6.026T(B)	Volume/ha	-do-
6.027T(A)	Volume(000)	- Crop composition: Lowland hardwood
6.027T(B)	Volume/ha	-do-
6.028T(A)	Volume(000)	- Crop composition: Upland hardwood
6.028T(B)	Volume/ha	-do-

DISTT. CHURACHANDPUR

(Volume in cu.m.)

6.029T(A)	Volume(000)	- Crop composition: Lowland hardwood
6.029T(B)	Volume/ha	-do-
6.030T(A)	Volume(000)	- Crop composition: Upland hardwood
6.030T(B)	Volume/ha	-do-

Contents

6.031T(A) Volume(000) - Crop composition: Bamboo brakes
6.031T(B) Volume/ha ---------------do---------------

DISTT. UKHRUL

(Volume in cu.m.)

6.032T(A) Volume(000) - Crop composition: Conifers
6.032T(B) Volume/ha -------------do------------

6.033T(A) Volume(000) - Crop composition: Lowland hardwood
6.033T(B) Volume/ha -----------------do---------------

6.034T(A) Volume(000) - Crop composition: Upland hardwood
6.034T(B) Volume/ha -----------------do--------------

DISTT. TAMENGLONG

(Volume in cu.m.)

6.035T(A) Volume(000) - Crop composition: Lowland hardwood
6.035T(B) Volume/ha -----------------do---------------

6.036T(A) Volume(000) - Crop composition: Upland hardwood
6.036T(B) Volume/ha ----------------do--------------

6.037T(A) Volume(000) - Crop composition: Bamboo brakes
6.037T(B) Volume/ha ----------------do--------------

DISTT. CHANDEL

(Volume in cu.m.)

6.038T(A) Volume(000) - Crop composition: Conifers
6.038T(B) Volume/ha -------------do------------

6.039T(A) Volume(000) - Crop composition: Lowland hardwood
6.039T(B) Volume/ha ----------------do-----------------

6.040T(A) Volume(000) - Crop composition: Upland hardwood
6.040T(B) Volume/ha -----------------do--------------

6.041T(A) Volume(000) - Crop composition: Bamboo brakes
6.041T(B) Volume/ha ---------------do-------------

ENTIRE STATE

(Volume in cu.m.)

6.042T(A) Volume(000) - Crop composition: Conifers
6.042T(B) Volume/ha -------------do----------

Contents

CHAPTER - VII

INVENTORY RESULTS: BAMBOO GROWING STOCK

Contents

CHAPTER - VIII

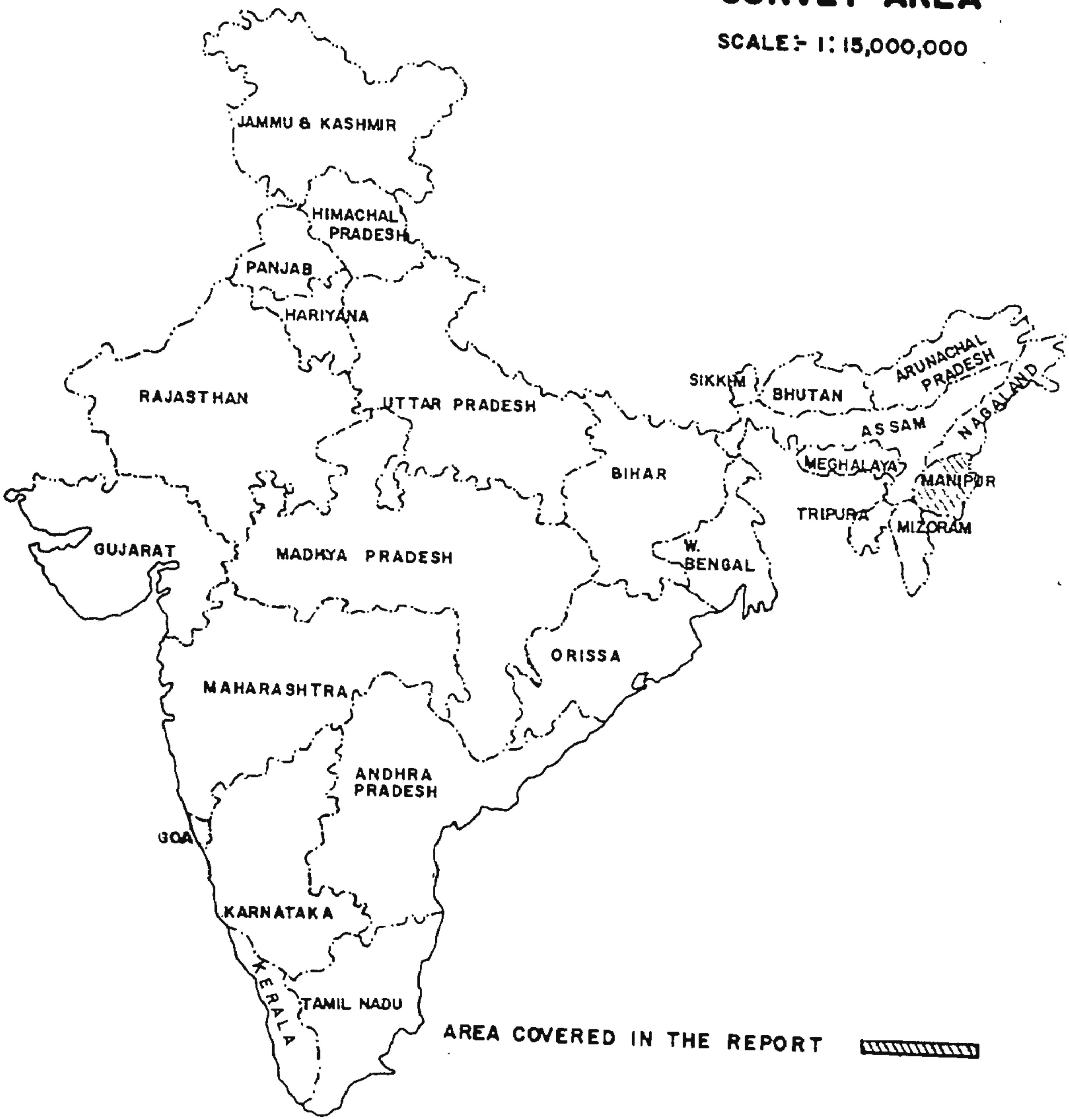
WOOD CONSUMPTION STUDY IN MANIPUR STATE

*****

Contents

MAP OF INDIA SHOWING SURVEY AREA

SCALE :- 1: 15,000,000



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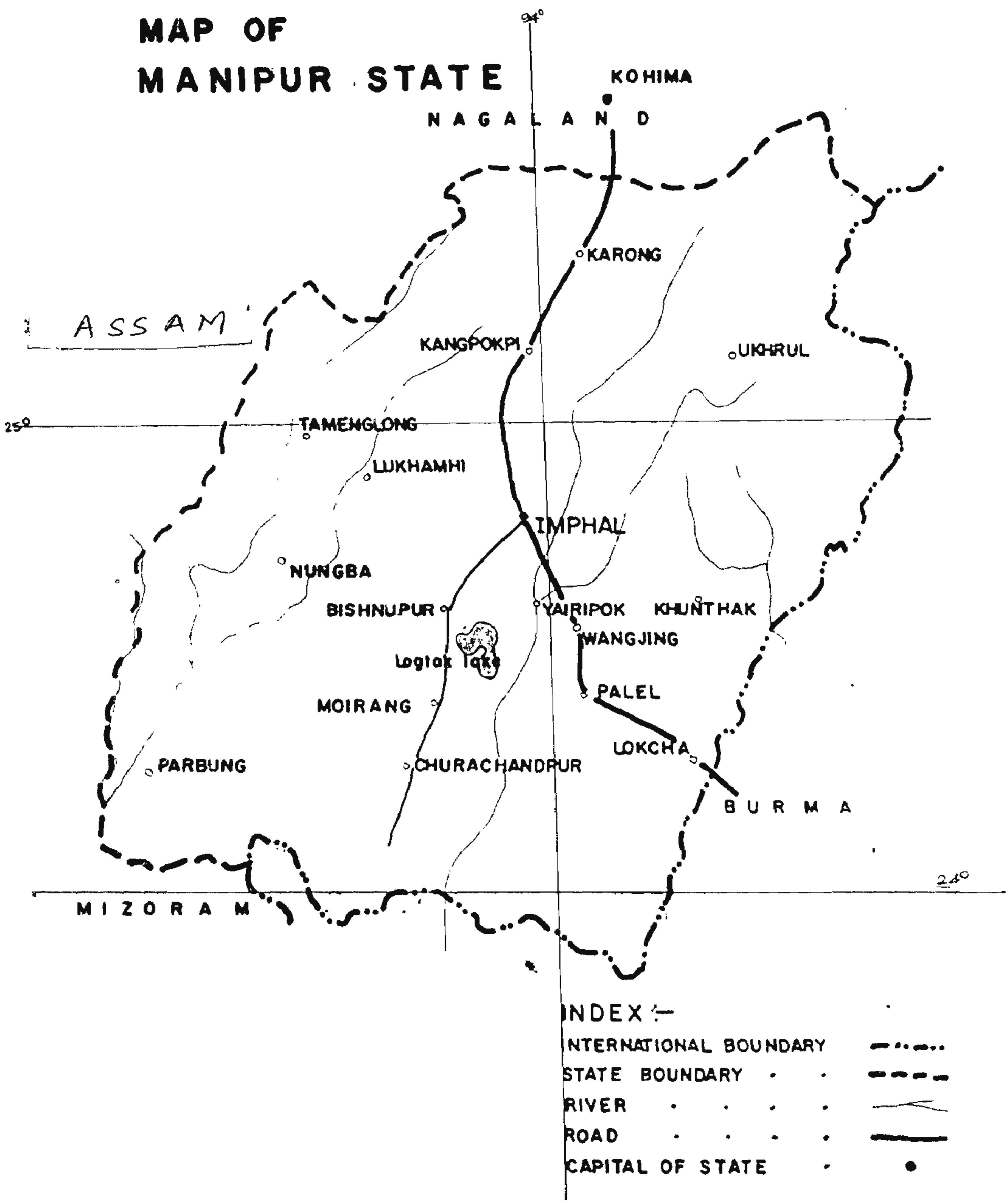
MAP OF
MANIPUR STATE
94°
KOHIMA
NAGALAND
ASSAM
KARONG
KANGPOKPI
UKHRUL
25°
TAMENGLONG
LUKHAMHI
IMPHAL
NUNGBA
BISHNUPUR
YAIRIPOK
KHUNTHAK
WANGJING
Logtak lake
PALEL
MOIRANG
LOKCHA
PARBUNG
CHURACHANDPUR
BURMA
24°
MIZORAM
INDEX :-
INTERNATIONAL BOUNDARY
STATE BOUNDARY
RIVER
ROAD
CAPITAL OF STATE

Contents

CHAPTER-I

INTRODUCTION

1.0 GENERAL:

The entire state of Manipur has been considered for ensuing assessment of forest resources. The tract dealt with lies between 93°-06' and 94°-48' East longitudes and 23°-47' and 25°-41' North latitudes. It is surrounded on the north by the Naga Hills of Nagaland, on the east by Somra tract and upper Chindwin areas of Burma, on the south by the Chin Hills of Burma and Mizo Hills of Mizoram and on the west by the Cachar and North Cachar Hills of Assam.

1.1 AREA AND POPULATION:

The total area of the state is 22,327 km^2 out of which about 1,800 km^2 forms the broad central valley of Manipur. The remaining area consists of hilly and mountainous terrain, the highest of which rises upto 3000 metres above mean sea level. The central valley has an average altitude of 850 metres above mean sea level and it drains towards south. The valley is marked with a large lake known as 'Loktak lake' and it is about 12 km. in length and 8 km. in width. The population of Manipur according to 1981 Census is 14,20,953 with the density of population of 64 persons per sq.km.

1.2 ADMINISTRATIVE UNITS AND AREAS:

The state has been divided into 8 revenue districts with headquarters at Imphal, Bishnupur, Thoubal, Senapati, Churachandpur, Ukhrul, Tamenglong and Chandel. 28 sub-divisions and 29 community development blocks are also established in these districts for administration at Sub-Divisional and Block levels. According to the Forest Authorities of Manipur the forest area of Manipur is 15,154 km^2. The administration of the forests is executed through two circles viz. territorial and functional. Territorial circle includes seven forest divisions and the functional circle comprises of three forest divisions. The entire forest area in Manipur state is in charge of the State Forest Department. It's classification by legal status, is reserved forests 1,377 km^2, protected forests 4,171 km^2 and unclassed forest 9,606 km^2. This forest area constitutes 67.87% of the geographical area of Manipur.

1.3 CLIMATE AND RAINFALL:

The climate in western part is tropical. The sub-tropical climate is observed in the rest of the area with distinct summer, winter and rainy seasons. The period from November to February is characterised by low temperatures and heavy dew at night. In April and May the day temperature

Contents

rises but often cools off towards the afternoon because of thunderstorms and light showers. The period from June to September is characterised by heavey rainfall. The range of temperature for the state is 0.0° C to 43.5° C.

The average rainfall and mean maximum and minimum temperatures of few important places is given below:

Places	Av. rainfall (1975-1984)	Mean temperature (1975-1984)	
		Max. °c	Min. °c
1. Imphal	125.7 cms.	N.A.	N.A.
2. Ukhrul	167.9 cms.	31.8	2.8
3. Churachandpur	143.6 cms.	33.25	1.5
4. Jiribum	267.5 cms.	38.75	6.14

1.4 TOPOGRAPHY:

Topographically Manipur is divided into two zones viz. the hills and the valley. The hill districts of Manipur are Senapati, Churachandpur, Ukhrul, Temenglong and Chandel. The valley districts are three namely: Imphal, Bishnupur and Thoubal. The hills constitute 90% of the total area of state. The alluvium plains of the Imphal valley are thickly populated and almost all available land is under paddy cultivation. Majority of the hill population is of scheduled tribes.

1.5 DRAINAGE:

The main rivers of Manipur are Imphal and Barak. Imphal river drains through Manipur valley in southern direction. The Barak river drains in south and south-western direction. Both hills and valley have slopes towards south. The other rivers are Iril, Thoubal, Nambul and Nambol.

1.6 GEOLOGY AND ROCKS:

Not much is known about the prevalent geological status of this part because no detailed geological survey has yet been carried out in the area. The Imphal valley consists of alluvium with the argillaceous rocks of Disang series as underlying rocks. The greater part of the hills on the western side has Eocene sand-stone, slates and shales as underlying rocks, resultant soil being clayey loam in places. The rest of the hills surrounding the Imphal valley have argillaceous rocks yielding alluvium that fills the valley.

Contents

Pure calcareous rocks are also met with towards the east on the Oinamlong hills and lateritie out-crops can be seen towards south-east at Moreh. Brine wells are met with around Ukhrul. There are also indications of oil in the Imphal valley.

1.7 SOILS:

The soils of the valley are fertile clay to clay loam which prove well for rice, but require an immense deal of manure for higher yields. Along the foothills the soils are, as a rule, better and richer. The soils of Longol hill are ferruginous clay to clayey loam with sandstones and shales.

1.8 MINERAL RESOURCES:

The region is very poor in mineral resources of economic importance. But Iron, Copper, Salt and Lime are found in small quantities.

1.9 LANDUSE PATTERN:

Land use classification as reported under Statistical Bulletin 1986 of the State Forest Department is as under:

	Category	Area in km^2.	Percentage to state geographical area.
1.	Forests	15,154.94	67.9
2.	Agri. tree land	337.10	1.5
3.	Crop land	3,170.72	14.2
4.	Pastures and barren	1,539.03	6.9
5.	Urban sites	293.13	1.3
6.	Current jhum	1,832.08	8.2
		22,327.00	100.00

Contents

1.10 <u>SOCIO-ECONOMIC CONDITION</u>:

The following table gives the classification of population of Manipur(1981 census) according to various parameters.

1.	Population	1,420,953
2.	Percentage of urban population	26.42
3.	Percentage of rural population	73.58
4.	Percentage of valley dwellers	65.38
5.	Percentage of hill dwellers	34.62
6.	Percentage of scheduled castes	1.25
7.	Percentage of scheduled tribes	27.30
8.	Percentage of agricultural workers	27.67
9.	Percentage of non-agricultural workers	15.53
10.	Percentage of literates	41.40
11.	Percentage of literates(Males)	50.74
12.	Percentage of literates(Females)	49.26

The state possesses 43.20% of the population classed as workers. The work participation of male workers outnumbers to that of female workers. According to 1981 census there were 57.77% male workers and 42.23% female workers. Out of the total population, according to 1981 census, 27.67% of the workers were engaged in agriculture sector and 15.53% in non-agriculture sector.

1.11 <u>INFRASTRUCTURE</u>:

The state lacks in necessary infrastructure which is vital for the economic development. There are practically no navigable waterways and Imphal is not so far connected by railways. The main transport system is through roads of which National Highway No. 39, connecting Imphal with Dimapur, is the only artery of communication. Another important road of 224 km. length connecting Imphal with Jirighat in Assam is called New Cachar Road. 90% of the state is hilly where very limited facilities are available for mechanised transport. Out of the five hill districts three district headquarters viz. Tamenglong, Ukhrul and Chandel are yet to be connected with tar road. The programme of

Contents

development of road communication has been given high priority in the succesive plans.

The existing roads are given in the table below:

S.No.	Name of road communication	Length(Kms)
1.	National Highways	434.30
2.	State Highways	527.00
3.	Major district roads	624.00
4.	Other district roads	340.30
5.	Inter village roads	2205.00
6.	Minicipal roads	193.80
7.	Forest roads	172.38
	Total:	4,496.78

(Source: Statistical Hand Book of Manipur: 1985)

1.12 FOREST PRODUCE AND FOREST BASED INDUSTRIES:

Manipur, though rich in forest resources, yields less to the state exchequer. In fact the expenditure is more than its revenue. In the year 1983-84 the revenue from Manipur forests was Rs. 54.47 lakhs as against its expenditure of Rs.211.03 lakhs. The potential out-turn of the forests is sawn timber, plywood size timber, pine wood, sawn timber, broad leaved pulp wood, pine pulp wood, bamboos and canes. The forest based industries like saw mills, pine and hard wood mills, plywood industry, one insulated paper mill, hard wood/particle board and chipboard mills are established in the state.

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Contents

CHAPTER-II

THE FORESTS

2.0 GENERAL DESCRIPTION:

The forests of Manipur are interesting from the ecological point of view. The Forest Atlas of India 1976 suggests that the western part of the area is under tropical wet ever green forests, north-eastern and northern part under sub-tropical pine forests(montane wet temparate forests) with the central valley under tropical moist deciduous forests. The forest areas are mixed stands of all age classes, they are dense and superior in site quality. The occurrence of 'Jhum' areas, bamboo brakes and cane brakes is a common feature. The Statistical Bulletin 1986 published by the Forest Department of Manipur gives the following forest classification:

1)	Wet temperate forests	: 1451.01 Km^2
2)	Pine forests	: 2442.77 Km^2
3)	Wet hill forests	: 6590.59 Km^2
4)	Semi-evergreen forests	: 644.89 Km^2
5)	Teak - Gurjan forests	: 610.74 Km^2
6)	Bamboo brakes	: 3268.43 Km^2
7)	Grassy blanks	: 145.57 Km^2
	Total:	15154.00 km^2

2.1 These forests are elaborately studied and described in the existing Working Plans. The description of the forests is summarised as below:

2.2 The forests in Manipur are sharply stratified by altitude. From the foothills, upto an elevation of 900 metres above MSL, the climax forest is of a semi-evergreen type comprising of Laurus-Melia-Bauhinia association. These forests are found in the western part of Manipur adjoining Cachar, and correspond to Champion and Seth's "Cachar Tropical Semi-evergreen" i.e 2 B/C 2. These forests have been subjected to heavy "jhuming" (shifting cultivation). One can see a lush brake of Muli bamboo (Melocanna basifera) in the old abandoned 'jhums'.

Falling in the same altitudinal zone, there is a belt of Teak - Gurjan forests (Tectona grandis -Dipterocarpus species) along the Burma border, together with D. turbinatus,

Contents

Melanorrhoea usitata, Dillenia, Xylia, Lagerstroemia, Terminalia, Gmelina and Bombax spp. which have a different and distinct floristic composition. This type too has not escaped from 'jhuming'.

2.3 At altitudes of 900 to 1800 metres above MSL, we find wet hill forests on the upper slopes of hills including hill tops corresponding to Champion and Seth's "Khasi sub-tropical wet hill forests" i.e. 8 B/C2.

2.4 Within the same altitude zone are the forests of Pinus khasya occurring in the hills in the north-eastern and southern parts of the state alongwith Quercus spp. , Castanopsis spp. These correspond to Champion and Seth's 'Assam Sub-tropical Pine Forests' i.e. 9/C2.

2.5 Between the altitude of 1700 to 2700 metres above MSL, forests of Quercus-Magnolia-Acer association are met with. These correspond to Champion and Seth's 'East Himalayan Wet temperat forests' i.e. 11 B/C1.

2.6 Above 2700 metres above MSL, sub-alpine vegetation is observed with characteristic species of Prunus, Pyrus, Ligustrum, Taxus, Ternstroemia, Bucklandia populnea, Acer campbelli, Magnolia campbelli, Castanopsis tribuloides, etc. Such areas are of very limited extent.

2.7 BAMBOO BRAKES

Bamboo brakes of large extent occur in the western, south-western and north-western parts of the state. Smaller areas of bamboo brakes occur almost all over except at altitudes 1700 metres above MSL. Most of the Cachar Tropical semi-evergreen type of forests in the western parts of the state has been hacked down for 'jhum' and the tree species have given way to a dense growth of Melocanna bamboo interspersed with some clump forming bamboos, and rare trees here and there.

The Khasi Sub-tropical Wet Hill Forests have also suffered from 'jhum' and have degenerated into bamboo brakes over large areas.

Bamboo also occur as an understorey in tree forests. About 15 species of bamboos occur in Manipur state. Except for Muli, Duloo, and Petcha, other bamboos occur in small quantities and in patches. It is seen that muli is

Contents

intrusive by nature being a runner type of bamboo and has a remarkable capacity to hold its own eliminating all other competitors.

2.8 CANE BRAKES:

In places where the soil is wet over a long period, and is an ill drained clay, rich in humus, various species of canes are found. They form an impenetrable thorny thicket, sometimes with a few trees standing over them. The stems are typically trailing and may go as far as 70-75 metres. A few palms such as Divistonia, Lienla etc. and Duloo bambaoo are found to occur with the canes. The important species of cane found occurring are Calamus tonuia, Calamus leptospadix, Calamus floribundus and Calamus erectus. Some of these cane brakes are being cleared for cultivation notably for 'Pan' cultivation reducing the availability of commercially important canes.

2.9 INJURIES TO FORESTS:

The forests of Manipur state are exposed to numerous injuries the major being the human intervention for cultivating agricultural crops. The hill people clear vast stretches of well-wooded areas and destroy good quality timber by burning for shifting cultivation, locally called "jhum". This has been going on over a long period and vast stretches of accessible areas, which once supported a luxurious tree growth, have been reduced to scrub and grassy blanks. The only forests, those are comparatively free from the ravages of shifting cultivation, are the wet temperate forests, because of their inaccessibility.'

The birds cause harm to the seeds and insects cause defoliator attack on trees. The forest fires are not a problem in sub-tropical conditions but the burnings for jhum do considerable damage to adjoining forests also.

The damage from frost, drought, storm and parasites is not very significant.

2.9.1 SHIFTING CULTIVATION:

Among the various injuries to the forest crop of Manipur shifting cultivation causes considerable loss. During the present survey as many as 170 plots were situated in the area affected by shifting cultivation spread over estimated area of 1362.27 km^2. The shifting cultivation has been practised for centuries throughout the hills of Manipur by the tribal population residing in the hills. According to 1981 census, the tribal population of Manipur is 3.34 lakhs. Though no survey to ascertain the exact population involved in shifting cultivation and area subjected to jhuming has

Contents

been carried out, it is estimated that out of the total tribal population, 90% are traditional jhumias who earn their livelihood by practising jhuming. The problem of jhuming further aggravates on account of large scale burning of forests for hunting purposes and heavy cutting of fuelwood for supplies to the population in valley.

2.10 RIGHTS AND CONCESSIONS:

The local tribals are allowed to cut fuelwood and timber from the unclassed forests for their bonafide uses. Firewood brought by headload to recognised markets, are exempted from any royalty. The royalty is recoverable whenever tribals sell the timber to areas outside their villages. The State Forest Policy envisages to undertake planned afforestation and creation of community and village forest to provide for the local needs in respect of small timber, fuelwood and fodder.

According to the Darbar Resolution of Manipur State, every hill village has right to cut fuel and wood within an area of 1/4 mile radius around the village. They are also allowed to collect minor forest produce required for their day to day life. They can graze their cattle inside the unclassed forest excluding areas which are closed for silvicultural reasons such as plantations and regeneration areas.

2.11 WILD LIFE:

The wild life species of the valley are very few viz. tigers, pigs and two species of deer. Wild fowl, geese, duck, teal, snipe etc. are found all over the valley. The wild animals found in Manipur hill territory are, elephants, leopards, wild cats, bears, wild pig, porcupine, wild buffalo, hill cow, rhinoceros, mole rat, monkey, snakes etc.

Two wild life parks viz. Kebul Lajao National Park with an area of 40.6 km^2 and Manipur Zoological Garden having an area of 0.08 km^2 are created. The National Park is situated at a distance of 60 km. from Imphal in the southern part of the Loktak lake, while the Zoological Garden is situated at Iroisemba, Uripok-Kamgchup road, 7 kms. from Imphal.

Two types of hunting licences are issued by the forest department viz. hunting licences and wild animal trapping licences. Some of the wild life species are declared protected in Manipur viz. brow antlered deer, leopard cat, tiger, clouded leopard and snow loris. Reptiles such as gharial, python, salamandar and birds viz. great Indian hornbill, Blyth's tragopan, white eared pheasants and large falcons are protected.

Contents

The wildlife wing is headed by the Addl. Chief Conservator of Forests as Chief Wildlife Warden.

2.12 MANAGEMENT OF FORESTS:

The available information about the management of the forests in different divisions is summarised below:

1) Working Plan for Reserved forests and Protected forests of Eastern Forest Division, Manipur - 1971-72 to 1980-81 by N.K. Singh.

It covers an area of 370 Km^2 (143 sq.miles) and includes Protection working circle, Plantation working circle, Fuel working circle, Improvement working circle and Game working circle. The Fuel working circle is worked with coppice with reserve system.

2) Working Plan for Reserved forests of Manipur Valley of Eastern Forest Division, Manipur - 1969-70 to 1979-80 by N.K. Singh.

It covers 215 Km^2 (83 sq.miles) Reserved forests of Manipur valley and they are managed under Protection working circle, Plantation working circle, Fuel working circle and Selection-cum-Improvement working circle. The Fuel working circle is worked under coppice with reserve system.

3) Working Plan for Western Forest Division, Manipur -1974-75 to 1983-84 by S.T. Singh.

It deals with six Reserved forests in the catchment of Barak river and extends over 324.26 Km^2. These forests are managed under Selection-cum-Improvement working circle, Plantation working circle and Minor forest working circle. The exploitable diameter for felling is kept as 60 cm. B.H. In Plantation working circle, it deals with jhum areas and scrub jungles and proposes planting of teak. The Bamboo overlapping working circle is worked on four years felling cycle. In Minor forest produce working circle, the extraction of agar, canes, thatching grass, honey and wax are suggested.

Contents

4) Working Plan for Sugnu Reserved forests of Manipur -1975-76 to 1984-85 by S.T.Singh.

It covers 142 Km^2 (54.77 sq. miles) of Manipur valley. The forests are managed under Plantation working circle and Pine rehabilitation working circle.

5) Working Plan for Dampi, Thongam, Mondum, Gwarok, Nongmaiching Reserved forest of Manipur - 1986-87 to 1995-96 by T.P. Singh.

It covers 239.74 Km^2 forests which are managed under Protection working circle, Plantation working circle, Fuel working circle, and Thatch grass overlapping working circle. The Plantation working circle prescribes planting of pines. The Fuel working circle is worked under coppice system.

6) Working Plan for Yangenching, Kangbung, Longya, Yangoupokpi Reserved forests of Manipur- 1987-88 to 1996-97 by A.K. Rana.

It deals with 324.53 Km^2 (32453 ha.) of forests and they are managed under Protection working circle, Selection-cum-Improvement working circle, Plantation working circle, Fuel working circle and Bamboo overlapping working circle. In Plantation working circle, plantation of teak and pine has been prescribed.

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Contents

CHAPTER-III

RESOURCES SURVEY METHODOLOGY.

OBJECTIVES OF THE SURVEY:

The objectives of this resources survey were :

To collect information on distribution of forest with regard to various parameters such as topography, altitude, aspect, slope, soil depth etc.

To collect various informations on crop data including origin of crop (whether the crop is of seed origin, coppice origin or a plantation), its composition, height, size, quantum of regeneration, injury to crop, fire incidence, grazing incidence, presence of weeds and grasses etc.

To collect information under bamboo occurrence such as species found, their density, quality, quantity and regeneration etc.

To estimate the forest areas under different crop composition and also to assess the extent of forest area under non-forest use.

To estimate the growing stock of trees and bamboos in areas having forest cover.

To determine the plantation potential of the land which is poorly stocked or unstocked.

To focus attention of the planners and forest officials on the critical aspects and conditions of the forests for timely remedial measures and for future planning.

AREA CONSIDERED FOR SURVEY:

For the purpose of this inventory, the entire forest area falling in Manipur state was considered. In order to decide forest areas, the recent Survey of India toposheets, preferably on 1:50,000 scale and in case of their non-availability, on 1" = 1 mile scale were used. All areas which are shown on these toposheets by double dotted forest boundaries or with green wash were taken as forest areas for undertaking this inventory.

Contents

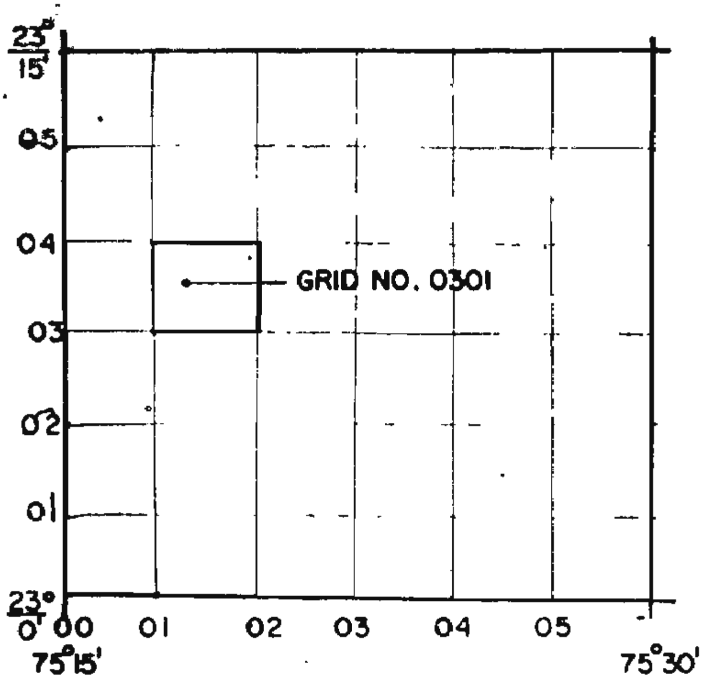


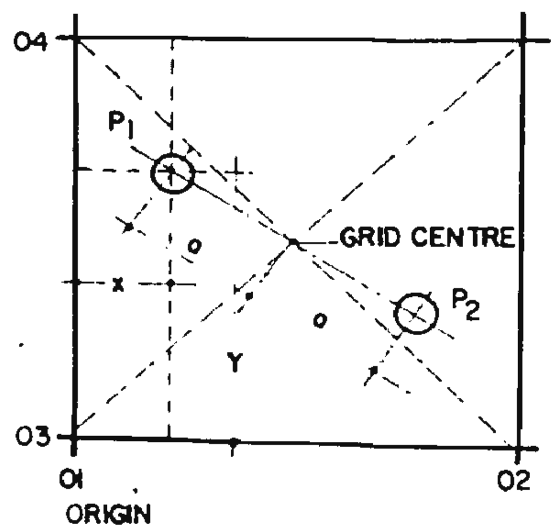
DIAGRAM-1

DIAGRAM SHOWING IDENTIFICATION OF GRIDS ON 1:50,000 OR 1:63,360 SCALE TOPOSHEETS

DIAGRAM-2

DIAGRAM SHOWING LAY-OUT OF PLOT IN 2½' X 2½' GRID

'X' & 'Y' ARE THE DISTANCE ALONG 'X' & 'Y' AXES WITH SW CORNER AS THE ORIGIN



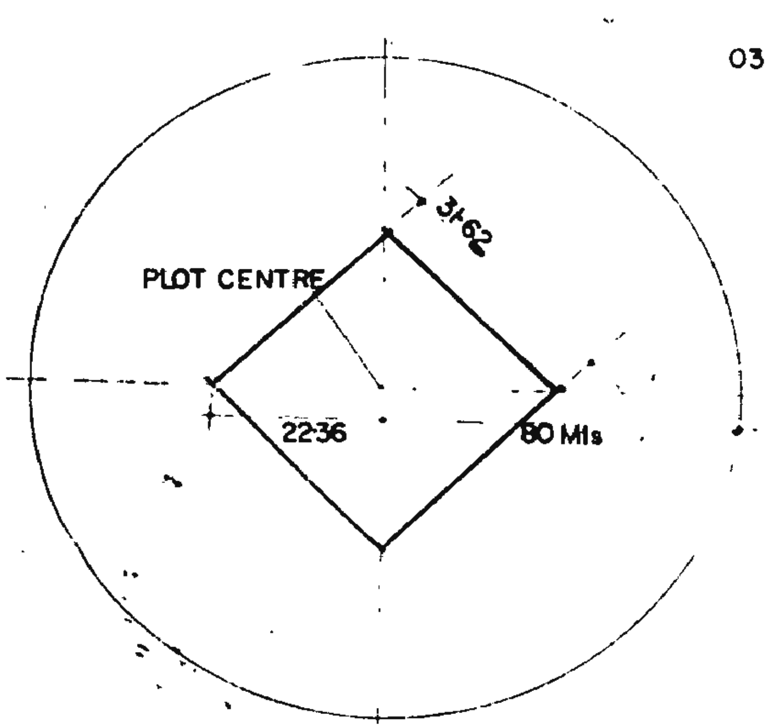


DIAGRAM-3

DIAGRAM SHOWING LAY-OUT OF PLOT

Contents

3.2 <u>INVENTORY DESIGN</u>:

A common inventory design for the whole organisation was evolved in consultation with the Central Statistical Organisation (Govt. of India) for undertaking inventory work in various parts of the country. The design envisaged the survey of two randomly selected plots, each of 0.1 ha area, in each grid of 2 1/2'x 2 1/2'(latitudes and longitudes) on the toposheet of 1:50,000 or 1:63,360 scale. A grid bounded by 2 1/2'x2 1/2' latitudes and longitudes covers about 20 sq.km.area in which 0.2 ha area is actually sampled. Thus the sampling intensity of the survey comes to 0.01%. The method of marking the plot centre on the map within grid is as follows :

Two sides (X-axis and Y-axis) of a grid were measured in millimeters. The length of these sides was divided by 0.6324 mm (side of 0.1 ha square plot) in case the map was on 1:50,000 scale, or by 0.4990 mm in case the map was on 1:63,360 scale. The quotient so obtained was rounded up. Let the numbers (quotient) for X-axis be x and that of Y-axis be y. Actually the number x gives the no. of plots that may fall along X-axis and number y gives the no. of plots that may fall along Y-axis. The product x X y gives the total number of sample plots that may exist in a grid of 2 1/2'x2 1/2'. Out of these plots (x X y), one plot was selected on the basis of random number and the second one with the help of the first plot which will be explained in next para. For the selection of 1st plot, one set of three random numbers were selected from random number table. If the random number selected for X-axis was less than x (quotient for X-axis), then it was retained and if the random number was more than x, then it was divided by x and the remainder was retained. Similar exercise was done for Y-axis also by taking next 3-digit set of random numbers. The figure (remainder) so obtained was multiplied by the side of the plot i.e. 0.6324 mm. in case of 1:50,000 scale map and by 0.4990 mm. in case of 1:63,360 scale map so as to get the actual coordinates of the 1st plot. The plot no. 1 of all the grids were marked on the map taking south west corner of respective grid as origin. The distance along X-axis was measured towards east and along Y-axis towards north. Thus the centre of plot 1 was marked on the map at the crossing of the two coordinates.

For marking the centre of second plot of each grid, the plot centre of 1st plot and centre of 2 1/2'x 2 1/2' grid were joined and the line extended to the same distance in opposite direction beyond grid centre. The point so reached was the plot centre of the second plot. The location of second plot is thus linked with the first plot. The layout of 2 1/2'x 2 1/2' grid and the plots are shown in diagrams 1, 2, and 3. All such plots were marked on the toposheets.

Contents

The plots so marked were visited only if they had fallen in dotted forest boundaries and green wash areas on 1:50,000 scale or 1:63,360 scale mapsheets.

3.3 LOCATION OF PLOT ON THE GROUND:

As stated earlier, the survey was confined to the forest areas only as decided on the basis of forest boundaries and green wash shown on the toposheets. The plot was visited if it had fallen in some forest area. All the forested plots of the survey area duly marked on the toposheets were allotted to various crews. The crews had drawn up their programme of halts at some convenient places in order to tackle maximum plots from their camps. The plots marked on the toposheet were exactly located on the ground with the help of some conspicuous feature which could be identified on the map as well as on the ground. Usually the following features were selected for this purpose:

1. Bench mark.
2. Triangulation point.
3. Village or road trijunction point.
4. Old bridges and culverts.
5. Old temples, mosques and churches.
6. Crossing of rail tracks with roads, streams, rivers etc.
7. Junctions of rivers or stream and roads.
8. Confluence of streams and rivers.
9. Junction of roads.
10. Prominent bends in roads, rivers or streams.
11. Old ponds and wells.
12. Springs.
13. Prominent topographical features in hilly region such as spurs, knolls etc.
14. Mile stones or kilometer stones.
15. Boundary pillars of international, state, district and forest areas etc.
16. Prominent bends of boundary etc.

After locating one of the above reference points on the ground as well as on the map, the bearing and distance from reference point to the plot centre were marked. This distance was traversed on the bearing calculated for the plot using Silva Compass and distance measured with a nylon rope/tape etc. While using compass the magnetic declination as indicated on the concerned toposheet was also taken into account. Similarly, for distance measurement the slope correction was applied to cover the actual horizontal distance of the plot measured from the map.

On reaching the plot centre, a square plot was laid out by taking distance of 22.36m. in all the four directions (north, south, east and west) from the plot centre. Thus an exact plot of Ø.1 ha area (having each side of 31.62 m. and diagonal of 44.72 m.) was laid out horizontally after making corrections for the slopes measured with the help of Blumleiss Hypsometer along 4 semi-diagonals (north, south, east, west).

3.4 FORMAT FOR DATA COLLECTION:

After laying out the plots in the field, various data were collected in the following field forms in codified manner (except in Plot Approach Form wherein information was collected in descriptive manner) as described in the Field Manual issued to the crews for the purpose of data collection. This facilitated the transfer of data on punch cards, consistency checking of collected data and finally in processing the data on electronic computer at a later stage. Various field forms used in this survey are:

1. Plot Approach Form.
2. Plot Description Form.
3. Plot Enumeration Form.
4. Sample Tree Form.
5. Bamboo Enumeration-cum-Clump Analysis Form.
6. Bamboo Weight Form.

1. Plot Approach Form.

As the title indicates, the form is a record of approach to the plot centre from the field camp of a crew. It is filled in by the crew leader as he proceeds from his camp to some conspicuous feature called reference point existing near by the plot. The distance and bearing from this well defined reference point to the plot centre were also recorded in it. The exact location of plot centre i.e. bearing and distance from two trees to the plot centre is also mentioned together with the time of departure from camp, time taken in various studies and time of arrival in the camp. This form helps the check crew or any other person to relocate the plot easily when required. The data on this form is recorded in descriptive manner with a neatly drawn sketch showing the location of reference point and the plot centre.

2. Plot Description Form.

This form is designed for recording qualitative description of 2 ha area around the plot centre. The information regarding administrative units, legal status, land use, topography, soil, vegetation, bamboo regeneration, biotic influence, accessibility and plantation potential etc. were recorded. The data was recorded in codified manner and was transferred to punch cards for further computer analysis. The stratification of area and classification of growing stock was done on the basis of these descriptions only.

3. <u>Plot Enumeration Form</u>.

In this form, all the trees having dia 10 cm. over bark and above and all the bamboo clumps occurring in whole of 0.1 ha sample plot were recorded by species This was meant for computing total growing stock existing in all such sample plots and finally in whole of the survey area which was estimated on the basis of these plots. This form helps in distributing the growing stock in terms of stems and volume by various parameters like species, diameter classes, forest types etc.

4. <u>Sample Tree Form</u>.

Detailed information regarding the species, diameter at breast height (over bark), height of tree, clear bole, bark thickness, dominance and defects etc. of all the trees occurring in north-west quadrant of all the plots, were recorded in this form. On the basis of these parameters (i.e. height, diameter and clear bole), we get volume of the plots which further enables us to estimate the total growing stock of the area falling under various strata.

5. <u>Bamboo Enumeration-cum-Clump Analysis Form</u>.

In this form, the data of individual culms occurring in the selected clumps bearing S.No. 1,9,17,25,33 .... etc. (i.e. the first and every eighth) in Plot Enumeration Form was recorded. Thus, the information about age, soundness, size and condition etc. of the culms of the above clumps was obtained and analysed in various columns of this form. This information gave the position of total bamboo stock by clump sizes occurring under various conditions.

6. <u>Bamboo Weight Form</u>.

This form was designed for collecting data to determine the green weight of bamboos of different species and sizes and further for establishing relationship between green weight and dry weight of bamboo culms. The data was recorded in respect of two selected culms from each dia class i.e. 2 to 5 cm, 5 to 8 cm and 8 cm and above and the green weights of three 30 cm long sub-samples, each taken from the bottom, the middle and the top portions of the culms were recorded. Further, these three samples were dried in air and finally in the oven in order to remove their entire moisture contents and to get their air dry weight. This facilitated to establish relation between the green weight and the dry weight of culms by species and sizes so as to know the total growing stock of bamboos in terms of weight.

Contents

3.5 **FIELD WORK**:

The inventory data collection from the forests of Manipur commenced in the month of Nov. 1986 and ended in April, 1988. The field work continued for two seasons namely November 86 to April 87 and November 87 to April 88. The movement of field parties, allotment, checking and supervision was controlled from the Base camp established at Forest Training School, Mantripukhri, Imphal for both seasons. During field work nine parties were formed to tackle the work in both the seasons. Each party comprised of one Jr.Tech.Assistant, one Dy. Ranger and two Fieldmen. Five jeeps and one truck were deployed to carry out the field work.

3.6 **FIELD CHECKING**:

During the course of field work, the checking of the surveyed plots was done by the Senior Technical Assistant who was also the incharge of the survey work during 1986-87. During 1987-88 Shri Animesh Shukla, Dy.Director looked after the field work w.e.f. Nov.87 to Jan.88. About 10% of the total number of plots tackled by various crews were checked and mistakes found (if any) during the checking were rectified in the field forms.

3.7 **MAPS AND PLOTS**:

The Survey of India toposheets covering the forest areas of Manipur state are listed below giving details of their scale, year of survey and number of plots tackled in each of them.

S.No.	Map sheet No.	Scale of map.	Year of survey of toposheet.	No. of plots inventoried by F.S.I.
1.	83 G/7	1:50,000	1975-76	03
2.	83 G/8	..	1971-72	50
3.	83 G/11	..	1972-73	12
4.	83 G/12	..	1971-72	69
5.	83 G/14	..	1973-74	15
6.	83 G/15	..	1972-73	67
7.	83 G/16	..	1971-72	63
8.	83 H/1	..	1971-72	13
9.	83 H/2	..	1971-72	42
10.	83 H/3	..	1970-71	64
11.	83 H/4	..	1970-71	50
12.	83 H/5	..	1971-72	70
13.	83 H/6	..	1971-72	71
14.	83 H/7	..	1971-72	71
15.	83 H/8	..	1971-72	59
16.	83 H/9	..	1971-72	68
17.	83 H/10	..	1971-72	63
18.	83 H/11	..	1971-72	60

Contents

19.	83 H/12	"	1970-71	72
20.	83 H/13	"	1969-70	12
21.	83 H/15	"	1969-70	33
22.	83 H/16	"	1970-71	69
23.	83 K/2	"	1973-74	13
24.	83 K/3	"	1972-73	71
25.	83 K/4	"	1971-72	66
26.	83 K/6	"	1972-73	12
27.	83 K/7	"	1972-73	72
28.	83 K/8	"	1971-72	49
29.	83 K/10	"	1974-75	10
30.	83 K/11	"	1970-71	37
31.	83 K/12	"	1970-71	52
32.	83 L/1	"	1969-70	20
33.	83 L/2	"	1969-70	15
34.	83 L/3	"	1969-70	46
35	83 L/4	"	N.A.	70
36.	83 L/5	"	1969-70	32
37	83 L/6	"	1970-71	68
38.	83 L/7	"	1970-71	37
39.	83 L/8	"	N.A.	5
40.	83 L/9	"	1970-71	48
41.	83 L/10	"	N.A.	11
42.	84 E/5	"	1970-71	1
43	84 E/9	"	N.A.	6
44.	84 E/13	"	N.A.	17
45.	84 I/1	"	N.A.	26
			Total:	1880

3.8 <u>CONSISTENCY CHECKING AND FORWARDING OF FIELD FORMS TO DATA PROCESSING UNIT</u>:

After completion of field work, the field forms for inventory of 1880 plots of Manipur state were manually checked in the Zonal office as per field manual and coding instructions meant for the purpose. Inconsistency noticed in the forms was removed after discussing the specific point with the concerned crew leader. All these field forms were finally forwarded to the Data Processing Unit of the Headquarter office at Dehradun on 20th June 1988, for computer analysis and processing the data for deriving various kinds of informations to meet the objectives of the survey.

3.9 <u>CONSTRAINTS IN DATA COLLECTION</u>:

Manipur is situated in a mountainous region of Himalayan ranges. Lack of infrastructure and difficult terrain made it impossible to reach some places of the state. The execution of survey was also difficult in many remote areas due to lack of labour and camping facilities.

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Contents

CHAPTER-IV

DATA PROCESSING.

4.0 SAMPLING DESIGN:

The grids were marked at 2 1/2'x 2 1/2' interval in the forest area/green wash area of the Survey of India map-sheets relating to the area of Manipur state. Two plots were laid in each grid, one at random and the other linked to the first in the opposite quadrant at an equal distance from the grid centre. The plots were square in shape, each having an area of 0.1 ha. but in the beginning of the survey some plots were laid out having an area of 0.2 ha.

4.1 DATA:

The basic data of the inventory was collected in the Plot Description Form, Plot Enumeration Form, Sample Tree Form and Bamboo Enumeration Form (clump forming and non-clump forming) and Bamboo Weight Form.

The field forms were precoded so that the field data could be easily transferred on to the floppy directly. There were 5182 field forms which involved transferring of the following number of records in each card design.

	Card design	No. of cards.
1.	Plot description	1880
2	Plot enumeration	3720
3.	Sample tree	6500
4.	Bamboo enumeration	225
5.	Bamboo weight data	233

4.2 DATA PROCESSING:

The data processing involved the following operations:

4.2.1 Manual processing:

The field forms were received in the Machine Data Management Unit of Forest Survey of India, Dehradun and were checked with the list supplied by the Central Zone office. Entries of the field forms were made in the register regarding the number of field forms relating to each map-sheet, grid and plot. The total number of records required to be transferred on to the floppy in each card design were also estimated and indicated in the register for future references. Job numbers, card design and left hand zeros, wherever missing, were filled up in the field forms.

Contents

Each entry in the field forms was checked for consistency in the data. The main checks applied were the range check for codes and logical check for inter-relation between the entries for two and more fields. Listings taken out of the data loaded on the magnetic tape/disk were checked to ensure complete loading and proper sequence of data.

Sample statistics were calculated and checked with the computer output to see if the calculations on computer were correct. These involved volume of enumerated tree form, local volume equation, plot volume and standard error etc. Intermediate computer output were checked for consistency and relevance of results.

4.2.2 Processing on electronic computer:

The data was transferred on to the floppy and after verification it was converted on to the magnetic tape. The same was edited, sorted and listing of loaded data taken out to check, if complete data was loaded correctly and in proper sequence. Volume of each enumerated tree was estimated from the local volume equations used for the species which were taken from the old inventory report of Manipur (year 1976).

Contribution of the volume of each enumerated tree towards per hectare volume was derived and stored in a tree/plot volume file created for further processing using the tree/plot volume file. The growing stock tables were prepared and standard error of the estimated growing stock in each crop composition was calculated. Area tables were also prepared.

The data of this survey was processed on System - IBM -3083 system of Oil & Natural Gas Commission, Dehradun.

4.3 AREA:

The following forest area figures as supplied by the State Forest Department were adopted for processing of the data.

S.No.	District	Area Km^2
1.	Imphal	346.20
2.	Thoubal	3.93
3.	Bishnupur	7.87
4.	Senapati	1735.00
5.	Churachandpur	3920.00
6.	Ukhrul	2624.00
7.	Tamenglong	3727.00
8.	Chandel	2790.00
9.	Entire state	15154.00

Contents

As described in para 4.0 above, the plots located in the entire forest area of 15154 km^2 and those of districts were identified for various parameters. The number of plots falling in the entire area and districts and the average area represented by each plot is as under:

Sl. No.	Region/district	Total forest (Km^2)	No. of plots	Av. area per plot (Km^2)
1.	Imphal, Thoubal and Bishnupur distts.	358	91	3.93
2.	Senapati distt.	1735	276	6.28
3.	Churachandpur distt.	3920	467	8.39
4.	Ukhrul distt.	2624	387	6.78
5.	Tamenglong distt.	3727	370	10.07
6.	Chandel distt.	2790	289	9.65
7.	Entire state	15154	1880	-

(Note: The forest areas of Thoubal and Bishnupur districts being smaller are clubbed with the adjoining Imphal district in the valley.)

Using above mentioned forest areas, number of plots and weightage per plot for the districts the forest area has been classified in different land uses.

The table no. 5.1 T gives the classification of area under different land uses by districts for the entire state. The area falling in land uses, dense tree forest, moderately dense tree forest, open tree forest, young plantations of forestry species, young crop of natural and artificial regeneration and bamboo brakes was considered as vegetated cover which was further grouped in four crop composition classes(strata) such as Conifers (comprising of Pines), Low land hard wood(comprising of Dipterocarpus, teak and miscellaneous species), Upland hard wood(Oaks and other broad leaf species above 1500 m. altitude) and Bamboo brakes.

The area under each crop composition was further classified by topography, slope classes, soil depth, top height, size classes, canopy layer etc.

It may be noted that the area estimates are based on ground observations i.e. in a limited number of sample plots. Therefore the areas under different categories given in the tables described above may be considered as indicative only and used with due caution.

Contents

4.4 SAMPLE TREE VOLUME:

The local volume equations developed for Pinus khasya and rest of the species in old Manipur report were used for estimating the enumerated tree volume.

The following local volume equations were used.

1. Pinus khasya

$$\sqrt{V} = -0.200251 + 2.927166 D$$

2. Rest of species:

$$\sqrt{V} = -0.226400 + 2.935870 D$$

(Diameter in metres)

4.5 ENUMERATED TREE VOLUME:

Volume of each enumerated tree was estimated from the breast height over bark diameter of the tree by using the local volume equation for each species given above. A few plots having 0.2 ha. area were converted to 0.1 ha. area. After calculating volume of each tree, the enumerated tree volumes were converted to per hectare volumes and stored on a magnetic tape/disk in a tree/plot volume file form together with species code, tree diameter, parameters of plots description form, per hectare stems and volume in the sample plot. This file helped in the tabulation of results by species and diameter class for different crop compositions.

4.6 PLOT VOLUME:

The estimated volume of each enumerated tree in a plot when added up over the whole plot provided the plot volume. It was converted to per hectare basis and stored in the tree/plot volume file. These plot volumes were used to estimate the sampling error of growing stock of each crop composition.

4.7 STAND TABLES:

The estimates of tree/plot volume file were utilised to clarify the tree by species and diameter, crop composition etc. Estimates of the number of stems per hectare and total stems by species and diameter classes were obtained for each district by crop composition. These were given in the computer output originally.

The number of stems per hectare and total stems over all districts combined for each crop composition were also worked out.

Contents

4.8 STOCK TABLES:

Estimates of volume per hectare and total volume by species and diameter classes were obtained for each district by crop composition from the tree/plot volume file. These were given in the computer output originally.

The volume per hectare and growing stock over all districts combined for each crop composition were also worked out.

4.9 SAMPLING ERROR:

The sampling was considered as systematic cluster sample having two sample plots in each cluster. In order to estimate sampling error the sample plots were considered to constitute simple random sample of unequal clusters, because in many cases only one plot was enumerated from a grid. As such the rates method of estimation is used and the sampling error is estimated as follows:

Let

n = Total number of clusters in a sample.

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

X_i = Number of plots in the ith cluster.

$$\bar{X} = \frac{\sum_{i=1}^{n} x_i}{n}$$

= Average number of plots per cluster.

$$\hat{R} = \frac{\sum_{i=1}^{n} y_i}{\sum_{i=1}^{n} x_i}$$

Estimate of average volume per hectare over all clusters.

Estimate of variance of $\hat{R}$

$$= \frac{N - n}{N \times n \quad \bar{X}^{2}} \sum_{i=1}^{n} \frac{(Y_i - \hat{R}\, x_i)^2}{n - 1}$$

Contents

$$= \frac{1}{n\,(n-1)\,\bar{x}^{2}} \sum_{i=1}^{n} (Y_i - \hat{R}\,X_i)^2$$

(Ignoring $\frac{(N-n)}{N}$ the finite population correction factor)

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

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

$$SE = \sqrt{\hat{V}\,\hat{R}}$$

$$SE\% = \frac{SE}{\hat{R}} \times 100$$

Standard errors have been estimated for the growing stock in each crop composition and over all the crop compositions.

4.10 BAMBOO:

BAMBOO AREA: The occurrence of bamboo species was examined in the area of about 1 ha. around the plot centre and its density and quality was recorded in the plot description form. The area under bamboo was estimated from this information by giving proper weightage to the plot for both clump forming bamboos and non-clump forming bamboos separately. Area under each quality of bamboo was also estimated from the number of plots falling in each quality. Dendrocalamus strictus/hamiltonii etc. occur in this area.

4.11 BAMBOO CLUMPS PER HECTARE:

The bamboo clumps occurring in each sample plot were enumerated by species and diameter class in plot enumeration form. This information was utilised to estimate the number of clumps per hectare by species clump size classes(diameter). Since quality was recorded in plot description form only, this information was merged with the plot enumeration form to estimate the number of clumps per hectare in each quality and clump size classes.

Contents

4.12 CULMS PER CLUMP:

Bamboo enumeration form contains the information of number of culms by age(current year, one to two and over two years) and soundness (green sound, green damaged, dry sound, dry damaged, and decayed). The culms were further classified by culm diameter class (2-5 cm., 5-8cm, and 8 cm and above). This information was used to estimate the number of culms per clump in different diameter classes.

4.13 CULMS PER HECTARE:

A)Clump forming bamboo: From the estimates of the number of clumps,estimates of the number of clumps per hectare and the number of culms per clump, the estimate of number of culms per hectare were obtained under different classes.

B) Non-clump forming bamboo: Non-clump forming bamboo enumeration form contains the information of number of culms by age and soundness and further classified by culm diameter class. This information was used to estimate the number of culms per hectare in different classes for muli bamboo(Melocanna bambusoides).

4.14 TOTAL NUMBER OF CULMS:

The estimation of number of culms per hectare and the area provided the estimates of the total number of bamboo culms under different classes separately for clump forming bamboo and non-clump forming bamboo.

4.15 BAMBOO WEIGHT:

Weight of freshly felled culms of different diameter classes of each species were given in bamboo weight form together with diameter, total height, utilisable length and top height etc. This information was used to estimate the green weight of bamboo culms by culm size class. In case of muli bamboo the weights are used from the old inventory report of Manipur.

These weights when applied to the number of culms per hectare provided green tonnage of bamboo in case of clump forming bamboo and muli bamboo separately.

The following factors were used to obtain green equivalent weight of different categories of culms as given in the old inventory report of Manipur:.

Dry sound	2.Ø
Dry damanged	1.Ø
Green sound	1.Ø
Green damaged	Ø.5
Decayed	Ø.Ø

Contents

CHAPTER V

INVENTORY RESULTS - AREA

5.0 GENERAL:

As described in the previous Chapter para 4.3, the forest areas adopted for this survey for different districts and number of plots occurring in each district is reproduced below in talbe no. 5.0 T.

Table No. 5.0T

FOREST AREAS AND NO. OF PLOTS IN EACH DISTRICT OF MANIPUR STATE

S.No.	Region/district	Total forest area (Km^2)	No. of sample plots	Av. area per plot (Km^2)
1.	Imphal, Thoubal & Bishnupur distts.	358	91	3.93
2.	Senapati distt.	1735	276	6.28
3.	Churachandpur distt.	3920	467	8.39
4.	Ukhrul distt.	2624	387	6.78
5.	Tamenglong distt.	3727	370	10.07
6.	Chandel distt.	2790	289	9.65
7.	Entire state	15154	1880	-

(The forest areas of Thoubal and Bishnupur districts being smaller are clubbed with the adjoining Imphal district in the valley.)

5.1 FOREST AREA BY LAND USE CLASSES FOR THE DISTRICTS AND THE ENTIRE STATE:

The table no. 5.1T gives the distribution of forest area by different land uses in the districts and the entire state.

Contents

Table No.5.1T

BREAK UP OF AREA BY LAND USE CLASSES

S.No.	Land use class	No. of plots and area by districts														
		Districts Imphal, Thoubal and Bishnupur		District Senapati		District Churachandpur		District Ukhrul		District Tamenglong		District Chandel		Entire state		Percentage
		No. of plots	Area in Km^2	No. of plots	Area in Km^2	No. of plots	Area in Km^2	No. of plots	Area in Km^2	No. of plots	Area in Km^2	No. of plots	Area in Km^2	No. of plots	Area in Km^2	
1.	Dense tree forest	3	11.00	17	106.87	14	117.52	1	6.78	18	181.31	3	28.96	56	453.24	2.99
2.	Moderately dense tree forest	16	62.95	80	502.90	125	1049.25	172	1166.22	125	1259.12	125	1206.75	643	5247.19	34.62
3.	Open tree forest	6	23.61	24	150.87	48	402.91	57	386.48	38	382.77	36	347.54	209	1694.18	11.18
4.	Scrub forest	2	7.87	5	31.43	7	58.76	11	74.59	2	20.15	17	164.13	44	356.93	2.35
5.	Bamboo brakes	40	157.36	-	-	82	688.31	-	-	53	533.87	22	212.39	197	1591.93	10.50
6.	Shifting cultivation	12	47.22	25	157.16	68	570.79	18	122.05	27	271.97	20	193.08	170	1362.27	8.99
7.	Plantations	3	11.80	35	220.02	35	293.79	46	311.90	35	352.55	15	144.81	169	1334.87	8.80
8.	Grass lands	1	3.93	2	12.57	2	16.79	2	13.56	2	20.15	3	28.96	12	95.96	0.63
9.	Barren lands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10.	Agri. land without trees in surround	-	-	9	56.58	2	16.79	1	6.78	4	40.29	1	9.65	17	130.09	0.86
11.	Agri. land with trees in surround	-	-	4	25.14	4	33.58	10	67.80	1	10.07	1	9.65	20	146.24	0.96
12.	Non forestry plantations	-	-	-	-	1	8.39	-	-	-	-	-	-	1	8.39	0.05
13.	Habitation	-	-	7	44.00	3	25.18	3	20.34	3	30.22	2	19.31	18	139.05	0.92
14.	Water bodies	-	-	-	-	1	8.39	1	6.78	1	10.07	1	9.65	4	34.89	0.23
[illegible]	Young crop (Regeneration)	4	15.73	17	106.86	26	218.24	29	196.63	22	221.61	19	183.42	117	942.49	6.21
[illegible]	Inaccessible area	4	15.73	51	320.60	49	411.31	36	244.09	39	392.85	24	231.70	203	1616.28	10.71
	Total	91	358.00	276	1735.00	467	3920.00	387	2624.00	370	3727.00	289	2790.00	1880	15154.00	100%

Contents

The above table indicates that 34.62% forest area is moderately dense while dense forests are hardly 2.99%. The percentage of open tree forests is 11.18% while scrub is only 2.35%. The bamboo brakes are noticed all over except areas of Senapati and Ukhrul districts. The extent of bamboo brakes is 10.50%. The shifting cultivation is noticed in all districts and its extent is over 8.99% area. The plantations of forestry species are taken all over state over an area of 8.80%. The extent of grass lands is negligible. The extent of barren lands is negligible as many have formed in to scrub. The agricultural lands, habitations, water bodies, non-forestry plantations are also neglegible. The young crop is noticed over 6.21% area. Nearly 10.71% area is inaccessible and it is spread in all districts.

5.2 AREA BY CROP COMPOSITIONS:

Out of the above land use pattern in different districts, the survey data was processed only for the forested or vegetated areas such as dense tree forests, moderately dense tree forests, open tree forests, bamboo brakes, plantations and young crop of natural or artificial regeneration.

The areas so arrived from the above said scrutiny were further classified into crop compositions. The state forests exhibit four distinct crop compositions such as areas under conifers (mainly pines), lowland hardwood (Dipterocarpus species, teak and miscellaneous species, upland hardwood such as oaks and other broad leaf species at higher altitudes and bamboo brakes.

Thus, the area under forest vegetated cover is classified under four crop compositions as under in different districts. The cases in which the crop composition was represented by only one sample plot were merged with the adjoining crop composition since the conclusion based on data of such small sample is not statistically acceptable. The following table 5.2T gives the details of areas.

Contents

Table NO.5.2T

BREAK UP OF FOREST VEGETATED AREA UNDER DIFFERENT CROP COMPOSITIONS IN DIFFERENT DISTRICTS AND ENTIRE STATE

S.No.	Crop composition	Districts Imphal, Thoubal & Bishnupur		District Senapati		District Churachandpur		District Ukhrul		District Tamenglong		District Chandel		Entire state		Percentage
		No. of plots	Area in Km^2	No. of plots	Area in Km^2	No. of plots	Area in Km^2	No. of plots	Area in Km^2	No. of plots	Area in Km^2	No. of plots	Area in Km^2	No. of plots	Area in Km^2	
1.	Conifers	-	-	6	37.72	-	-	18	122.05	-	-	4	38.61	28	198.38	1.76
2.	Low land hardwood	32	135.88	116	729.20	241	2022.95	227	1539.14	212	2135.47	186	1795.64	1014	8348.28	74.12
3.	Upland hardwood	-	-	51	320.60	7	58.76	60	406.82	26	261.90	8	77.23	152	1125.31	9.99
4.	Bamboo brakes	40	157.36	-	-	82	688.31	-	-	53	533.87	22	212.39	197	1591.93	14.13
	Total	72	283.24	173	1087.52	330	2770.02	305	2068.01	291	2931.24	220	2123.87	1391	11263.90	100

Contents

The above table indicates that the conifers are seen over 1.76% area in Senapati, Ukhrul and Chandel districts i.e. at higher altitudes in hilly region. The low land hardwoods are over 74.12% area and majority of the area is in Churachandpur, Ukhrul, Tamenglong and Chandel districts. Upland hardwoods are not seen in valley districts i.e Imphal, Thoubal and Bishnupur districts. The percentage of such areas is 9.99%. The bamboo brakes are seen in all districts except Senapati and Ukhrul districts. In all 1391 plots representing 11263.90 ha. area are taken as base for further study.

The break up of this area by topography, slope, soil depth, top height classes, size classes, canopy layer is given in the following paragraphs.

5.3 AREA BY CROP COMPOSITIONS AND TOPOGRAPHY:

The following table gives the distribution of area by crop compositions and topography classes in different districts and entire state.

Table No. 5.3T

BREAK-UP OF AREAS BY CROP COMPOSITIONS AND TOPOGRAPHY CLASSES IN DIFFERENT DISTRICTS AND ENTIRE STATE

(Area in Km^2)

Crop composition	Topography classes				Total
	Flat	Gently rolling	Hilly	Very hilly	
	DISTRICTS: IMPHAL, THOUBAL & BISHNUPUR				
Conifers	-	-	-	-	-
Low land hardwood	-	11.80	114.08	-	125.88
Upland hardwood	-	-	-	-	-
Bamboo brakes	-	-	157.36	-	157.36
Total	-	11.80	271.44	-	283.24

Contents

DISTRICT:SENAPATI

Conifers	-	-	31.43	6.29	37.72
Low land hardwood	-	-	578.33	150.87	729.20
Upland hardwood	-	-	169.73	150.87	320.60
Bamboo brakes	-	-	-	-	-
Total	-	-	779.49	308.03	1087.52

DISTRICT:CHURACHANDPUR

Conifers	-	-	-	-	-
Low land hardwood	-	16.79	1586.46	419.70	2022.95
Upland hard wood	-	-	8.39	50.37	58.76
Bamboo brakes	-	8.39	512.04	167.88	688.31
Total	-	25.18	2106.89	637.95	2770.02

DISTRICT:UKHRUL

Conifers	-	-	54.24	67.81	122.05
Low land hard wood	-	6.78	1220.46	311.90	1539.14
Upland hardwood	-	-	169.51	237.31	406.82
Bamboo brakes	-	-	-	-	-
Total	-	6.78	1444.21	617.02	2068.01

Contents

			DISTRICT: TAMENGLONG		
Conifers	-	-	-	-	-
Low land hardwood	-	-	1369.92	765.55	2135.47
Upland hardwood	-	-	171.24	90.66	261.90
Bamboo brakes	-	-	342.48	191.39	533.87
Total	-	-	1883.64	1047.60	2931.24
			DISTRICT: CHANDEL		
Conifers	-	-	38.61	-	38.61
Low land hardwood	9.65	19.31	1747.37	19.31	1795.64
Upland hardwood	-	9.65	67.58	-	77.23
Bamboo brakes	-	9.65	202.74	-	212.39
Total	9.65	38.61	2056.30	19.31	2123.87
			ENTIRE STATE		
Conifers	-	-	124.28	74.10	198.38
Low land hardwood	9.65	54.68	6616.62	1667.33	8348.28
Upland hardwood	-	9.65	586.45	529.21	1125.31
Bamboo brakes	-	18.04	1214.62	359.27	1591.93
Total	9.65	82.37	8541.97	2629.91	11263.90
%age	0.09	0.73	75.83	23.35	100

The above tabulation indicates that Conifers are confined to hilly and very hilly regions. Similar is the case with low land hardwoods, upland hardwoods and bamboo brakes. The table for the entire state indicates that more than 75% area is under hilly topography.

Contents

5.4 AREA BY CROP COMPOSITIONS AND SLOPE CLASSES:

The following table no. 5.4T gives the break up of area by crop compositions and slope classes in different districts and the entire state.

Table No. 5.4T

BREAK-UP OF AREA BY CROP COMPOSITION AND SLOPE CLASSES IN DIFFERENT DISTRICTS AND ENTIRE STATE

Area in Km^2

Crop composition	Slope classes					Total
	Not recorded	0-10%	10-60%	60-100%	100% & more	
			DISTRICTS: IMPHAL, THOUBAL & BISHNUPUR			
Conifers	-	-	-	-	-	-
Low land hardwood	11.80	3,93	82.61	27.54	-	125.88
Upland hardwood	-	-	-	-	-	-
Bamboo brakes	7.87	-	137.69	7.87	3.93	157.36
Total	19.67	3.93	220.30	35.41	3.93	283.24
			DISTRICT: SENAPATI			
Conifers	-	-	37.72	-	-	37.72
Low land hardwood	88.01	-	534.33	88.01	18.85	729.20
Upland hardwood	31.44	-	270.31	18.85	-	320.60
Bamboo brakes	-	-	-	-	-	-
Total	119.45	-	842.36	106.86	18.85	1087.52

Contents

DISTRICT:CHURACHANDPUR

Conifers	-	-	-	-	-	-
Lowland hardwood	151.09	8.39	1284.28	486.85	92.34	2022.95
Upland hardwood	-	-	33.58	8.39	16.79	58.76
Bamboo brakes	33.58	-	402.91	251.82	-	688.31
Total	184.67	8.39	1720.77	747.06	109.13	2770.02

DISTRICT:UKHRUL

Conifers	6.78	-	74.59	33.90	6.78	122.05
Lowland hardwood	135.61	13.56	935.69	406.82	47.46	1539.14
Upland hardwood	27.12	-	216.97	122.05	40.68	406.82
Bamboo brakes	-	-	-	-	-	-
Total	169.51	13.56	1227.25	562.77	94.92	2068.01

DISTRICT:TAMENGLONG

Conifers	-	-	-	-	-	-
Lowland hardwood	292.11	-	1279.27	473.43	90.66	2135.47
Upland hardwood	20.15	-	181.31	60.44	-	261.90
Bamboo brakes	40.29	10.07	423.07	50.37	10.07	533.87
Total	352.55	10.07	1883.65	584.24	100.73	2931.24

Contents

DISTRICT: CHANDEL

Conifers	9.65	9.65	19.31	-	-	38.61
Lowland hardwood	144.81	48.27	1052.28	473.05	77.23	1795.64
Upland hardwood	-	-	57.92	-	19.31	77.23
Bamboo brakes	9.65	-	164.13	38.61	-	212.39
Total	164.11	57.92	1293.64	511.66	96.54	2123.87

ENTIRE STATE

Conifers	16.43	9.65	131.62	33.90	6.78	198.38
Lowland hardwood	823.43	74.15	5168,46	1955.70	326.54	8348.28
Upland hardwood	78.71	-	760.09	209.73	76.78	1125.31
Bamboo brakes	.91.39	10.07	1127.80	348.67	14.00	1591.93
Total	1009.96	93.87	7187.97	2548.00	424.10	11263.90
Percentage	8.97	0.83	63.81	22.62	3.77	100

These figures indicate that majority of the crop compositions are situated on slopes 10-60% followed by 22.62% area under slopes varying from 60-100%. The areas under slope class 0-10% are negligible.

5.5 AREA BY CROP COMPOSITIONS AND SOIL DEPTH CLASSES:

The study of areas under different crop compositions and different soil depth classes was made in all districts. The following table gives the area details for the different districts and the entire state.

Table No. 5.5T

BREAK-UP OF AREA BY CROP COMPOSITIONS AND SOIL DEPTH CLASSES IN DIFFERENT DISTRICTS AND ENTIRE STATE

(Area in Km^2)

Crop composition	Soil dpeth classes					Total
	No soil	Very shallow (Less than 15 cm deep)	Shallaw (15-30cm deep)	Medium (30-90cm deep)	Deep (Above 90 cm deep)	
			DISTRICTS: IMPHAL, THOUBAL & BISHNUPUR			
Conifers	-	-	-	-	-	-
Lowland hardwood	-	-	-	62.95	62.93	125.88
Upland hardwood	-	-	-	-	-	-
Bamboo brakes	-	-	-	118.02	39.34	157.36
Total	-	-	-	180.97	102.27	283.24
			DISTRICT: SENAPATI			
Conifers	-	-	-	12.57	25.15	37.72
Lowland hardwood	-	-	6.29	458.89	264.02	729.20
Upland hardwood	-	-	12.57	132.01	176.02	320.60
Bamboo brakes	-	-	-	-	-	-
Total	-	-	18.86	603.47	465.19	1087.52

Contents

DISTRICT: CHURACHANDPUR

Conifers	-	-	-	-	-	-
Lowland hardwood	-	8.39	8.39	864.58	1141.59	2022.95
Upland hardwood	-	-	-	25.18	33.58	58.76
Bamboo brakes	-	-	-	41.97	646.34	688.31
Total	-	8.39	8.39	931.73	1821.51	2770.02

DISTRICT: UKHRUL

Conifers	-	-	-	6.78	115.27	122.05
Lowland hardwood	-	-	-	386.48	1152.66	1539.14
Upland hardwood	-	6.78	-	33.90	366.14	406.82
Bamboo brakes	-	-	-	-	-	-
Total	-	6.78	-	427.16	1634.07	2068.01

DISTRICT: TAMENGLONG

Conifers	-	-	-	-	-	-
Lowland hardwood	-	10.07	10.07	916.64	1198.69	2135.47
Upland hardwood	-	10.07	-	141.02	110.81	261.90
Bamboo brakes	-	-	-	251.83	282.04	533.87
Total	-	20.14	10.07	1309.49	1591.54	2931.24

Contents

DISTRICT: CHANDEL

Conifers	-	-	-	9.65	28.96	38.61
Lowland hardwood	-	-	-	386.16	1409.48	1795.64
Upland hardwood	-	-	-	9.65	67.58	77.23
Bamboo brakes	-	-	9.65	19.31	183.43	212.39
Total	-	-	9.65	424.77	1689.45	2123.87

ENTIRE STATE

Conifers	-	-	-	29.00	169.38	198.38
Lowland hardwood	-	18,46	24.75	3075.70	5229.37	8348.28
Upland hardwood	-	16.85	12.57	341.76	754.13	1125.31
Bamboo brakes	-	-	9.65	431.13	1151.15	1591.93
Total	-	35.31	46.97	3877.59	7304.03	11263.90
Percentage	0.0	0.31	0.42	34.42	64.85	100

The table indicates that the majority of the crop compositions are situated on medium to deep soils. Very negligible extent of area is under very shallow and shallow soils (i.e.0.31% and 0.42% respectively).

5.6 AREA BY CROP COMPOSITIONS AND TOP HEIGHT CLASSES:

The break up of area by crop compositions is as under by top height classes in different districts and entire state:

Contents

Table No. 5.6T

BREAK-UP OF AREA BY CROP COMPOSITIONS AND TOP HEIGHT CLASSES IN DIFFERENT DISTRICS AND ENTIRE STATE

Area in Km2

DISTTS. IMPHAL, THOUBAL AND BISHNUPUR

Crop composition	Top height classes								
	1-5 m	6-10 m	11-15 m	16-20 m	21-25 m	26-30 m	30 and above m	Not recorded	Total
Conifers	-	-	-	-	-	-	-	-	-
Lowland hardwood	15.73	15.73	23.61	51.15	15.73	3.93	-	-	125.88
Upland hardwood	-	-	-	-	-	-	-	-	-
Bamboo brakes	-	-	-	-	-	-	-	157.36	157.36
Total	15.73	15.73	23.61	51.15	15.73	3.93	-	157.36	283.24

DISTRICT: SENAPATI

Crop composition	1-5 m	6-10 m	11-15 m	16-20 m	21-25 m	26-30 m	30 and above m	Not recorded	Total
Conifers	-	-	12.57	12.57	6.29	6.29	-	-	37.72
Lowland hardwood	169.73	144.58	188.59	194.87	31.43	-	-	-	729.20
Upland hardwood	56.58	37.72	75.43	75.43	56.58	18.86	-	-	320.60
Bamboo brakes	-	-	-	-	-	-	-	-	-
Total	226.31	182.30	276.59	282.87	94.30	25.15	-	-	1087.52

DISTRICT: CHURACHANDPUR

Crop composition	1-5 m	6-10 m	11-15 m	16-20 m	21-25 m	26-30 m	30 and above m	Not recorded	Total
Conifers	-	-	-	-	-	-	-	-	-
Lowland hardwood	293.79	293.79	486.85	470.06	352.55	83.94	41.97	-	2022.95
Upland hardwood	-	8.39	8.39	33.59	8.39	-	-	-	58.76
Bamboo brakes	-	-	-	-	-	-	-	688.31	688.31
Total	293.79	302.18	495.24	503.65	360.94	83.94	41.97	688.31	2770.02

DISTRICT: UKHRUL

Crop composition	1-5 m	6-10 m	11-15 m	16-20 m	21-25 m	26-30 m	30 and above m	Not recorded	Total
Conifers	-	-	-	27.12	47.47	40.68	6.78	-	122.05
Lowland hardwood	183.07	291.56	386.48	393.26	189.85	88.14	6.78	-	1539.14
Upland hardwood	81.36	33.90	115.27	81.37	67.80	20.34	6.78	-	406.82
Bamboo brakes	-	-	-	-	-	-	-	-	-
Total	264.43	325.46	501.75	501.75	305.12	149.16	20.34	-	2068.01

Contents

Crop composition	Top height classes								
	1-5 m	6-10 m	11-15 m	16-20 m	21-25 m	26-30 m	30 and above m	Not recorded	Total
DISTRICT:TAMENGLONG									
Conifers	-	-	-	-	-	-	-	-	-
Lowland hardwood	292.11	251.83	342.48	664.82	453.28	130.95	-	-	2135.47
Upland hardwood	30.22	40.29	20.15	90.66	70.51	10.07	-	-	261.90
Bamboo brakes	-	-	-	-	-	-	-	533.87	533.87
Total	322.33	292.12	362.63	755.48	523.79	141.02	-	533.87	2931.24
DISTRICT:CHANDEL									
Conifers	-	-	-	9.65	19.31	9.65	-	-	38.61
Low land hardwood	193.08	231.70	395.81	598.55	173.77	86.88	115.85	-	1795.64
Upland hardwood	9.65	-	28.97	28.96	9.65	-	-	-	77.23
Bamboo brakes	-	-	-	-	-	-	-	212.39	212.39
Total	202.73	231.70	424.78	637.16	202.73	96.53	115.85	212.39	2123.87
ENTIRE STATE									
Conifers	-	-	12.57	49.34	73.07	56.62	6.78	-	198.38
Lowland hardwood	1147.51	1229.19	1823.82	2372.71	1216.61	393.84	164.60	-	8348.29
Upland hardwood	177.81	120.30	248.21	310.01	212.93	49.27	6.78	-	1128.31
Bamboo brakes	-	-	-	-	-	-	-	1591.93	1591.93
Total	1325.32	1349.49	2084.60	2732.06	1502.61	499.73	178.16	1591.93	11263.90
Percentage	11.77	11.98	18.51	24.25	13.34	4.44	1.58	14.13	100

Contents

This table indicates that the maximum extent of crop i.e. 24.25% is in 16-20 m top height class followed by 11-15 m and 21-25 m classes respectively. The crop of 31 m and above is seen in Churachandpur, Ukhrul and Chandel districts only the extent of which is only 1.58%.

5.7 AREA BY CROP COMPOSITIONS AND SIZE CLASSES:

The forests of the state are studied from the point of sizes of trees such as regeneration class, pole crop, timber etc. The break up of area by crop composition and size classes in different districts and entire state is given below:

Table No. 5.7T

BREAK-UP OF AREA BY CROP COMPOSITIONS AND SIZE CLASSES IN DIFFERENT DISTRICTS AND ENTIRE STATE

Area in Km^2

Crop composition	Size classes						
	Not recorded	Regeneration class (crop below 10 cm. dia.)	Pole crop (10-20 cm. dia.)	Small timber (20-30 cm. dia.)	Big timber (30cm and more dia.)	Mixed size class	Total
			DISTRICTS: IMPHAL, THOUBAL & BISHNUPUR				
Conifers	-	-	-	-	-	-	-
Lowland hardwood	-	27.54	27.54	3.93	-	66.87	125.88
Upland hardwood	-	-	-	-	-	-	-
Bamboo brakes	157.36	-	-	-	-	-	157.36
Total	157.36	27.54	27.54	3.93	-	66.87	283.24

Contents

DISTRICT: SENAPATI

Conifers	-	-	-	18.86	-	18.86	37.72
Lowland hardwood	-	251.45	150.87	37.72	-	289.16	729.20
Upland hardwood	-	75.43	56.58	12.57	-	176.02	320.60
Bamboo brakes	-	-	-	-	-	-	-
Total	-	326.88	207.45	69.15	-	484.04	1087.52

DISTRICT: CHURACHANDPUR

Conifers	-	-	-	-	-	-	-
Lowland hardwood	-	512.03	402.91	176.27	33.58	898.16	2022.95
Upland hardwood	-	-	8.39	41.98	-	8.39	58.76
Bamboo brakes	688.31	-	-	-	-	-	688.31
Total	688.31	512.03	411.30	218.25	33.58	906.55	2770.02

DISTRICT: UKHRUL

Conifers	-	-	-	13.56	33.90	74.59	122.05
Lowland hardwood	-	406.82	332.24	162.73	27.12	610.23	1539.14
Upland hardwood	-	101.71	94.92	40.68	27.12	142.39	406.82
Bamboo brakes	-	-	-	-	-	-	-
Total	-	508.53	427.16	216.97	88.14	827.21	2068.01

Contents

DISTRICT: TAMENGLONG

Conifers	-	-	-	-	-	-	-
Lowland hardwood	-	503.65	251.83	181.31	90.66	1108.02	2135.47
Upland hardwood	-	70.52	10.07	10.07	-	171.24	261.90
Bamboo brakes	533.87	-	-	-	-	-	533.87
Total	533.87	574.17	261.90	191.38	90.66	1279.26	2931.24

DISTRICT: CHANDEL

Conifers	-	-	-	19.31	-	19.30	38.61
Lowland hardwood	-	308.93	366.85	115.85	115.85	888.16	1795.64
Upland hardwood	-	9.65	19.31	-	-	48.27	77.23
Bamboo brakes	212.39	-	-	-	-	-	212.39
Total	212.39	316.58	386.16	135.16	115.85	955.73	2123.87

ENTIRE STATE

Conifers	-	-	-	51.73	33.90	112.75	198.38
Lowland hardwood	-	2010.42	1532.24	677.81	267.21	3860.60	8348.28
Upland hardwood	-	257.31	189.27	105.30	27.12	546.31	1125.31
Bamboo brakes	1591.93	-	-	-	-	-	1591.93
Total	1591.93	2267.73	1721.51	834.84	328.23	4519.66	11263.90
%age	14.13	20.13	15.28	7.41	2.92	40.13	100

This tabulation indicates that conifers are in timber size classes, low land hard woods are in mixed classes while the upland hardwoods exhibit more percentage in pole, small size timber and mixed classes.

Contents

5.8 AREA BY CROP COMPOSITIONS AND CANOPY LAYERS OR STOREYS:

The study was made to identify areas by canopy layers or storeys in different districts and entire state. The details of which are given below:

Table No. 5.8T

BREAK-UP OF AREA BY CROP COMPOSITIONS AND CANOPY LAYERS IN DIFFERENT DISTRICTS AND ENTIRE STATE

Area in Km^2

Crop composition	Canopy layers or storey classes				Total
	No storey	One storeyed forest	Two storeyed forest	Three or more storey -ed forest	
			DISTRICTS: IMPHAL, THOUBAL & BISHNUPUR		
Conifers	-	-	-	-	-
Lowland hardwood	23.60	11.80	90.48	-	125.88
Upland hardwood	-	-	-	-	-
Bamboo brakes	-	157.36	-	-	157.36
Total	23.60	169.16	90.48	-	283.24
			DISTRICT: SENAPATI		
Conifers	-	6.29	31.43	-	37.72
Lowland hardwood	201.16	169.73	358.31	-	729.20
Upland hardwood	69.15	56.57	194.88	-	320.60
Bamboo brakes	-	-	-	-	-
Total	270.31	232.59	584.62	-	1087.52

DISTRICT: CHURACHANDPUR

Conifers	-	-	-	-	-
Lowland hardwood	436.49	386.12	1200.34	-	2022.95
Upland hardwood	-	16.79	41.97	-	58.76
Bamboo brakes	-	688.31	-	-	688.31
Total	438.49	1091.22	1242.31	-	2770.02

DISTRICT: UKHRUL

Conifers	-	6.78	115.27	-	122.05
Lowland hardwood	305.12	372.92	861.10	-	1539.14
Upland hardwood	88.15	81.36	230.53	6.78	406.82
Bamboo brakes	-	-	-	-	-
Total	393.27	461.06	1206.90	6.78	2068.01

DISTRICT: TAMENGLONG

Conifers	-	-	-	-	-
Lowland hardwood	423.07	241.75	1460.58	10.07	2135.47
Upland hardwood	50.36	20.15	191.39	-	261.90
Bamboo brakes	10.07	523.80	-	-	533.87
Total	463.50	785.70	1651.97	10.07	2931.24

Contents

DISTRICT: CHANDEL

Conifers	-	-	38.61	-	38.61
Lowland hardwood	251.00	328.24	1216.40	-	1795.64
Upland hardwood	-	9.65	67.58	-	77.23
Bamboo brakes	212.39	-	-	-	212.39
Total	463.39	337.89	1322.59	-	2123.87

ENTIRE STATE:

Conifers	-	13.07	185.31	-	198.38
Lowland hardwood	1640.44	1510.56	5187.21	10.07	8348.28
Upland hardwood	207.66	184.52	726.35	6.78	1125.31
Bamboo brakes	222.46	1369.47	-	-	1591.93
Total	2070.56	3077.62	6098.87	16.85	11263.90
%age	18.38	27.32	54.15	0.15	100

The table indicates that majority of the forest is either one storeyed or two storeyed. The extent of three storeyed forest is very negligible i.e 0.16% which is seen in Ukhrul and Tamenglong districts. 18.38% area is under no storey. This is due to larger extent of shifting cultivation areas in which crop has not established in regular storeys.

5.9 AREAS SUGGESTED FOR AFFORESTATION:

The areas under land use open tree forest, scrub forest, shifting cultivation and grass lands need immediate attention for soil conservation and planting with superior species of commercial importance. The net available area for planting will have to be worked out each year after detailed examination of the site with reference to growing stock, soil depth, erosion, soil type etc.

The total extent of area needing categorical scrutiny for afforestation is 3509.34 km^2 in the entire state.

Contents

5.10 REGENERATION STATUS(ENTIRE STATE):

An assessment of regeneration status of vegetation was made during the course of inventory of forest resources of the state of Manipur. The exercise involved the counting of number of seedlings of commercially important species in 16 sq.metres area around the plot centre. The important species taken into account for this purpose Pinus khasya in the conifers, Acer spp., Adina cordifolia, Ailanthus excelsa, Albizzia spp., Alnus spp., Cedrela serrata, Quercus spp., Dipterocarpus spp., Michelia spp., Gmelina arborea, Lagerstroemia parviflora etc.

The status of regeneration was classified as under based on 16 sq.metres area around the plot centre.

1. More than 16 seedlings - Profuse
2. 8-16 seedlings - Adequate
3. Upto 8 seedlings - Inadequate
4. No regeneration - Absent
5. Regeneration damaged by grazing/fire - Damaged regeneration

The survey results reveal that the regeneration of economically important species as enumerated above is either absent or inadequate in whole of the area but the regeneration of other misc. species was found adequate to cover land in due course if protected from jhuming and other biotic interference. In the accessible areas, the over felling of trees for various purposes has posed a problem in the regeneration of important species like Phoebe hainesiana, Terminalia myriocarpa, Michelia champaca, Tectona grandis, Dipterocarpus species etc. In pure bamboo forest natural regeneration of tree species is practically absent. In only 1% of the forest area profuse or adequate regeneration of economically important species was noticed. The degraded areas and areas with growth of inferior species, are gradually planted with superior and economically important species like Teak, Pine etc.

5.11 SOIL EROSION(ENTIRE STATE)

The extent of soil erosion was also studied in Manipur. The results show that about 98% of the area suffers from mild soil erosion which means practically no soil erosion. Small gullies or erosion is found in about 2% of the

Contents

area. Thus, soils in Manipur have enough stability to provide support to the forest crop. The shifting cultivation areas are subjected to maximum soil erosion.

5.12 GRAZING INCIDENCE(ENTIRE STATE):

The grazing in Manipur forests is found heavy near habitations surrounding the forest area. The observations show that only 54% area in Manipur state is safe from grazing. Light grazing is recorded in 30% of the forest area, 11% area is affected with medium grazing and only 5% forest area is heavily grazed.

5.13 FIRE INCIDENCE AND OTHER INJURIES TO CROP(ENTIRE STATE):

The forests in Manipur are subject to frequent fires which occur annually as a recurring incidence during the months from January to May. The fire causes a great destruction to these forests. The local people set fires in order to facilitate illicit cutting of trees for growing agricultural crops, constructing new dwellings, huntings, etc. The fire incidence in Manipur forests was also studied in the survey under four categories namely very heavy, frequent, occasional and no fire by occular judgment. The result shows that in 58% of the area, no fire incidence was observed. Occasional fire was observed in 38% of the area. Frequent and heavy fires were observed only in 3% and 1% of the areas respectively. Thus, generally 40% of the forest is subject to fire injuries.

The other injuries to forests were studied in various categories e.g. borer attack, leaf defoliator attack, top drying of timber, girdling and illicit felling of trees, wind damages, climber damages etc. The major injury to forest under this category is by girdling and illicit cutting of trees the extent of which is 44.41%.

5.14 OCCURRENCE OF BAMBOOS:

The bamboo crop generally comes up as an understorey in the tree covered areas but in Manipur state, the occurrence of bamboo is of a characteristic nature. Apart from growing as an understorey in forest areas it grows profusely in areas which were formerly under shifting cultivations resulting into bamboo brakes. The total area under bamboo forest both as under storey and bamboo brakes is as under.

1) Area under bambo understorey	-	2099.84 km^2
2) Area under bamboo brakes	-	1591.93 km^2
Total	-	3691.77 km^2

This area exhibits bamboos of variety of species out of which some are clump forming and some are non-clump forming. The non-clump forming bamboos usually grow on old shifting cultivation areas.

The extent of clump forming bamboos and non-clump forming bamboos is as under:

Table No. 5.14T

Particulars	Clump forming Bamboos	Non-clump forming Bamboos
Common species	1)Dendrocalamus hamiltonii 2)Dendrocalamus strictus 3)Dendrocalamus longispathus 4)Teinostachyum dullo 5)Bamboosa balcooa	1)Melocanna bambusoides
Area	1813.64 km^2	1878.13 km^2

Thus, the total area of 3691.77 km^2 is under bamboo crop out of which 1813.64 km^2 is under clump forming and 1878.13 km^2 under non-clump forming bamboos. The bamboo crop of good quality and density is noticed along southern side particularly along Burma border.

5.15 CANE BRAKES(ENTIRE STATE):

The canes are found in wet lands where the soil is wet over a long period, and is an ill drained clay and rich in humus. Various species such as Calamus tenuis, Calamus leptospadix, Calamus floribundus and Calamus erectus are found. Canes form an impenetrable thorny thicket sometimes with a few trees standing over them. The stems are typically trailing and may go as far as 70-75 metres.

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CHAPTER VI

INVENTORY RESULTS- GROWING STOCK

6.Ø GENERAL:

On the basis of number of trees enumerated during the survey in differnt diameter classes from 1Ø-15cm to 8Ø cm and above, the information on total number of trees and the stems per ha. in different crop compositions in different districts and entire state has been compiled and enclosed herewithin tables no.6.Ø.1T(A & B) to 6.Ø.23T(A & B). The tables (A) are for the total number of stems in thousand while tables (B) are for stems per hectare. Similarly on the basis of volume calculations of trees by similar diameter classes the estimates of total volume in thousand cubic meters and volume per ha. in different crop compositions in different districts and entire state are enclosed herewith in tables no. 6.Ø.24T(A & B) to 6.Ø.46T (A & B). The tables (A) are for the total volume in thousand cublic metres and tables (B) are for volume per hectare. These tables are indexed as under for ready reference.

Contents

Table No. 6.0.47T

INDEX OF TABLES

Crop composition	Districts						
	Imphal, Thoubal &Bishnupur	Senapati	Churachandpur	Ukhrul	Tamenglong	Chandel	Entire state
STEMS IN THOUSANDS/STEMS PER HA.							
Conifers		6.0.3T(A) 6.0.3T(B)		6.0.9T(A) 6.0.9T(B)		6.0.15T(A) 6.0.15T(B)	6.0.19T(A) 6.0.19T(B)
Lowland hardwood	6.0.1T(A) 6.0.1T(B)	6.0.4T(A) 6.0.4T(B)	6.0.6T(A) 6.0.6T(B)	6.0.10T(A) 6.0.10T(B)	6.0.12T(A) 6.0.12T(B)	6.0.16T(A) 6.0.16T(B)	6.0.20T(A) 6.0.20T(B)
Upland hardwood		6.0.5T(A) 6.0.5T(B)	6.0.7T(A) 6.0.7T(B)	6.0.11T(A) 6.0.11T(B)	6.0.13T(A) 6.0.13T(B)	6.0.17T(A) 6.0.17T(B)	6.0.21T(A) 6.0.21T(B)
Bamboo brakes	6.0.2T(A) 6.0.2T(B)		6.0.8T(A) 6.0.8T(B)		6.0.14T(A) 6.0.14T(B)	6.0.18T(A) 6.0.18T(B)	6.0.22T(A) 6.0.22T(B)
All combined							6.0.23T(A) 6.0.23T(B)
VOLUME IN THOUSAND CUBIC METRES /VOLUME PER HA.							
Conifers		6.0.26T(A) 6.0.26T(B)		6.0.32T(A) 6.0.32T(B)		6.0.38T(A) 6.0.38T(B)	6.0.42T(A) 6.0.42T(B)
Lowland hardwood	6.0.24T(A) 6.0.24T(B)	6.0.27T(A) 6.0.27T(B)	6.0.29T(A) 6.0.29T(B)	6.0.33T(A) 6.0.33T(B)	6.0.35T(A) 6.0.35T(B)	6.0.39T(A) 6.0.39T(B)	6.0.43T(A) 6.0.43T(B)
Upland hardwood		6.0.28T(A) 6.0.28T(B)	6.0.30T(A) 6.0.30T(B)	6.0.34T(A) 6.0.34T(B)	6.0.36T(A) 6.0.36T(B)	6.0.40T(A) 6.0.40T(B)	6.0.44T(A) 6.0.44T(B)
Bamboo brakes	6.0.25T(A) 6.0.25T(B)		6.0.31T(A) 6.0.31T(B)		6.0.37T(A) 6.0.37T(B)	6.0.41T(A) 6.0.41T(B)	6.0.45T(A) 6.0.45T(B)
All combined							6.0.46T(A) 6.0.46T(B)

Contents

6.1 CROP COMPOSITIONS AND NUMBER OF STEMS AND STEMS PER HA. IN DIFFERENT DISTRICTS AND ENTIRE STATE:

The information tabulated in the tables 6.01T(A) to 6.023T(B) is summarised and reproduced below by crop compositions and by different districts and entire state.

6.1T(A)

BREAK-UP OF NUMBER OF STEMS AND STEMS/HA. BY CROP COMPOSITIONS IN DIFFERENT DISTRICTS AND ENTIRE STATE:

Crop composition	Area Km^2	Total stems in '000'	Stems /ha.	Percentage
	DISTRICTS: IMPHAL, THOUBAL & BISHNUPUR			
Conifers	-	-	-	-
Lowland hardwood	125.88	2074.500	164.800	86.99
Upland hardwood	-	-	-	-
Bamboo brakes	157.36	310.349	19.722	13.01
Total	283.24	2384.849	84.198	100.00
	DISTRICT: SENAPATI			
Conifers	37.72	930.179	246.601	4.06
Lowland hardwood	729.20	13417.270	184.000	58.57
Upland hardwood	320.60	8562.332	267.072	37.37
Bamboo brakes	-	-	-	-
Total	1087.52	22909.781	210.66	100.00

Contents

DISTRICT: CHURACHANDPUR

Conifers	-	-	-	-
Lowland hardwood	2022.95	47494.277	234.777	90.69
Upland hardwood	58.76	2541.358	432.500	4.85
Bamboo brakes	688.31	2333.651	33.904	4.46
Total	2770.02	52369.286	189.057	100.00

DISTRICT: UKHRUL

Conifers	122.05	3753.035	307.500	7.69
Lowland hardwood	1539.14	37433.445	243.210	76.76
Upland hardwood	406.82	7583.098	186.400	15.55
Bamboo brakes	-	-	-	-
Total	2068.01	48769.578	235.828	100

DISTRICT: TAMENGLONG

Conifers	-	-	-	-
Lowland hardwood	2135.47	40722.578	190.696	84.61
Upland hardwood	261.90	6051.02	231.043	12.57
Bamboo brakes	533.87	1356.917	25.417	2.82
Total	2931.24	48130.522	164.760	100.00

Contents

DISTRICT: CHANDEL

Conifers	38.61	804.582	208.387	1.41
Lowland hardwood	1795.64	50811.805	282.973	89.27
Upland hardwood	77.23	4015.955	519.999	7.06
Bamboo brakes	212.39	1284.452	60.476	2.26
Total	2123.87	56916.794	267.986	100.00

ENTIRE STATE

Conifers	198.38	5487.795	276.630	2.37
Lowland hardwood	8348.28	191954.076	229.932	82.92
Upland hardwood	1125.31	28753.860	255.519	12.42
Bamboo brakes	1591.93	5285.372	33.201	2.29
Total	11263.90	231481.103	205.507	100.00

The above tabulation indicates that the stems/ha. is highest (267.986) in Chandel district while it is lowest(84.198) in valley districts of Imphal, Thoubal and Bishnupur. The total stocking of conifers is 5487795 stems i.e. 2.37% with 276.630 stems per ha. Majority of the stock is occurring in Ukhrul district. The figures in talbe no. 6.019T(A) indicate that nearly 83% crop is in the diameter class 10-30 cm. As regard the lowland hardwoods they occur in all districts and the total stock is 1,91,954076 stems i.e. 229.932 stems per ha. contributing 82.92% of the total growing stock of the state. The table no. 6.0.20T(A) indicates that 88.89% stock is in the diameter class 10-30cm. The proportion of higher diameter classes is negligible. In case of upland hardwoods the stocking is noticed in all districts except valley districts of Imphal, Thoubal and Bishnupur. The total stock of upland hardwoods is 28753860 stems i.e. 255.512 stems/ha. contributing 12.42% of the growing stock. The table no. 6.021T(A) indicates that 91.92% stock is in the diameter class 10-30 cm. The other higher diameter classes are represented in very low percentage. In case of bamboo brakes the stocking is seen in all districts except district Senapati. In all 5285372 stems i.e. 33.207 stems/ha. are seen contributing 2.29 % of the stock. The table no. 6.0.22T(A) indicates the trees of 10-15 cm. diameter class are maximum amongst all i.e. to the extent of 55.21% This is due to periodic use of these lands for shifting cultivations. Out of the total stock of 231481103 stems (which is 205.505 stems/ha.), 117121517 are in 10-15 cm. diameter class which is nearly 50.60% of the total stock. The proportion of trees in other diameter classes goes on reducing in higher diameter classes. The number of trees above 80 cm. diameter class are 970826 stems which is hardly 0.42%.

6.2 CROP COMPOSITIONS AND TOTAL VOLUME IN THOUSAND CUBIC METERS AND VOLUME PER HECTARE IN DIFFERENT DISTRICTS AND ENTIRE STATE:

The information tabulated in tables 6.024T(A) to 6.046T(B) is summerised below by crop compositions and by different districts and entire state.

Table No. 6.2T

BREAKUP OF TOTAL VOLUME AND VOLUME PER HA. BY CROP COMPOSITIONS IN DIFFERENT DISTRICTS AND ENTIRE STATE:

Crop composition	Area Km^2	Volume in '000' cu.m.	Volume cu.m. per ha.	Percentage
DISTRICTS: IMPHAL, THOUBAL & BISHNUPUR				
Conifers	-	-	-	-
Lowland hardwood	125.88	368.900	29.306	85.84
Upland hardwood	-	-	-	-
Bamboo brakes	157.36	60.844	3.867	14.16
Total	283.24	429.744	15.172	100.00

Contents

DISTRICT:SENAPATI

Conifers	37.72	284.303	75.392	5.43
Lowland hardwood	729.20	2031.317	27.857	38.78
Upland hardwood	320.60	2922.200	91.148	55.79
Bamboo brakes	-	-	-	-
Total	1087.52	5237.820	48.163	100.00

DISTRICT:CHURACHANDPUR

Conifers	-	-	-	-
Lowland hardwood	2022.95	10185.605	50.350	90.06
Upland hardwood	58.76	476.518	81.096	4.21
Bamboo brakes	688.31	648.048	9.415	5.73
Total	2770.02	11310.171	40.83	100.00

DISTRICT:UKHRUL

Conifers	122.05	945.569	77.474	11.44
Lowland hardwood	1539.14	5811.773	37.760	70.34
Upland hardwood	406.82	1505.607	37.009	18.22
Bamboo brakes	-	-	-	-
Total	2068.01	8262.949	39.956	100.00

Contents

		DISTRICT: TAMENGLONG		
Conifers	-	-	-	-
Lowland hardwood	2135.47	11702.094	54.799	80.54
Upland hardwood	261.90	2609.927	99.654	17.96
Bamboo brakes	533.87	216.960	4.064	1.50
Total	2931.24	14528.981	49.565	100.00
		DISTRICT: CHANDEL		
Conifers	38.61	187.290	48.496	1.58
Lowland hardwood	1795.64	10642.781	59.270	89.93
Upland hardwood	77.23	725.251	93.908	6.13
Bamboo brakes	212.39	279.696	13.169	2.36
Total	2123.87	11835.018	55.723	100.00
		ENTIRE STATE		
Conifers	198.38	1417.160	71.440	2.75
Lowland hardwood	8348.28	40742.576	48.802	78.95
Upland hardwood	1125.31	8239.502	73.217	15.97
	9473.59		51.70	
Bamboo brakes	1591.93	1205.552	7.574	2.33
Total	11263.90	51604.730	45.814	100.00

The above tabulation indicates that the volume per ha. is highest in Chandel district (55.723) and lowest (15.172) in valley districts of Imphal, Thoubal and Bishnupur.

Contents

The total volume of coniferous crop is 1417160 cu.m. i.e. 2.75% with 71.440 cu.m. volume per ha. Majority of the coniferous volume is occurring in Ukhrul district. The figures in table 6.0.42T(A) indicate that the maximum volume is spread between diameter class 20-25 to 40-50 cm. which is 1153.690 cu.m. or 81.40 percent of total volume. The spread of volume in other diameter classes is low. The major contribution in volume is by Pinus khasya/insularis.

As regards the lowland hardwoods the total volume is 40742516 cu.m. i.e. 48.802 cm/ha. or 78.95% of total volume. This volume is spread in all districts. The table no. 6.043T(A) shows that this volume is spread in almost all diameter classes. The lowest is 1906.730 cu.m. in diameter class 10-15 cm. while the highest is 5699.134 cu.m. in the class 40-50 cm. The volume in the diameter class 80 cm. and above is considerble i.e. 5620604 cu.m. In case of upland hardwoods the total volume is 8239502 cu.m. with 73.217 cu.m./ha. or 15.97% of the total volume. This volume is spread in all districts except those in valley i.e. Imphal, Thoubal and Bishnupur districts. The figures in table 6.0.44T(A) suggest that this volume is spread in all diameter classes. It is maximum 1620309 in dia. class 80 cm and above while minimum 278.773 in dia. class 10-15 cm. The maximum contribution of volume is by Quercus species. In case of Bamboo brakes the total volume is 1205552 cu.m. or 7.574 cu.m./ha. It is hardly 2.33% of the total volume and is largely seen in Churachandpur district. The table no. 6.0.45T(A) indicates that volume is spread in all diameter classes with maximum (153585 cu.m.) in 80 cm. and above and lowest 54587 in 10-15 cm. class. The distribution of volume in various diameter classes is also uneven which may be due to periodical clear felling of these areas for shifting cultivation in the past.

Out of the total volume of 51604730 cu.m. in the entire state maximum volume(14528981 cu.m.) is contributed by Tamenglong district while lowest (429744 cu.m.) is from Imphal, Thoubal and Bishnupur districts. The table no. 6.0.46T(A) indicates that the volume is spread evenly in all the diameter classes. The maximum volume (7394498 cu.m.) is from diameter class 80 cm and above and while lowest (2281239 cu.m.) is from diameter class 10-15 cm.

6.3 DISTRIBUTION OF STEMS AND VOLUME BY DIFFERENT SPECIES IN TOTAL GROWING STOCK BY CROP COMPOSITIONS:

The study was conducted to find out the distribution of stems and volume of the species occurring in larger scale in different crop compositions. The results of this study are reproduced below.

Contents

Table No. 6.3T

BREAK-UP OF STEMS/VOLUME BY SPECIES OCCURRING ON LARGE SCALE IN DIFFERENT CROP COMPOSITIONS:

Species	Total stems in 000	No. of stems/ ha.	%age	Total volume in(000) cu.m.	Vol./ ha. in cu.m.	%age
			CROP COMPOSITION -CONIFERS AREA- 198.38 km^2			
Pinus khasya/ insularis	2845.992	143.461	51.86	1001.146	50.466	70.64
Quercus species	589.896	29.736	10.75	96.801	4.881	6.83
Castanopsis hystrix	432.481	21.80.	7.88	61.646	3.107	4.35
Quercus serrata	128.732	6.490	2.35	38.560	1.945	2.72
Rest of species	1490.694	75.14[illegible]	27.16	219.007	11.041	15.46
Total	5487.795	276.634	100	1417.160	71.440	100
			CROP COMPOSITION -LOWLAND HARDWOODS: AREA-8348.28 km^2			
Quercus species	28817.314	34.519	[illegible]5.01	4941.836	5.918	12.13
Castanopsis hystrix	12900.988	15.454	6.72	1969.831	2.360	4.83
Schima wallichi	9261.466	11.095	4.82	2477.438	2.968	6.08
Castanopsis indica	5632.205	6.746	[illegible].93	574.810	0.689	1.41
Ficus species	3129.564	3.749	[illegible].63	923.237	1.108	2.27
Albizzia lebbek	2743.338	3.286	[illegible].43	468.477	0.561	1.15
Quercus serrata	2489.647	2.983	1.30	823.046	0.985	2.02
Kydia calycina	2113.389	2.532	1.10	240.670	0.288	0.59

Contents

Alnus nepalensis	1777.156	2.128	0.92	560.131	0.670	1.37
Dipterocarpus turbinatus	1650.417	1.976	0.86	1186.507	1.420	2.91
Gmelina arborea	1561.743	1.869	0.81	682.308	0.817	1.67
Pinus khasya /insularis	1157.043	1.385	0.60	675.481	0.809	1.66
Rest of species	118719.806	142.208	61.87	25218.744	30.209	61.91
Total	191954.076	229.930	100	40742.516	48.802	100

(Note: The variation in the percentages of stems and volumes for different species is due to their varying proportions in different diameter classes.)

CROP COMPOSITION: UPLAND HARDWOODS

Area: 1125.31 km^2

Quercus species	3214.897	28.568	11.18	1048.182	9.313	12.72
Castanopsis hystrix	1363.295	12.114	4.74	150.679	1.339	1.83
Alnus nepalensis	1085.181	9.643	3.77	338.318	3.007	4.11
Pinus khasya /insularis	961.475	8.544	3.34	380.244	3.379	4.61
Schima wallichi	768.302	6.828	2.67	214.591	1.906	2.60
Quercus serrata	398.684	3.544	1.39	113.575	1.009	1.38
Rest of species	20962.026	186.271	72.91	5993.913	53.264	72.75
Total	28753.860	255.512	100	8239.502	73.217	100

(Note: The variation in the percentage of stems and volumes for different species is due to their varying proportions in different diameter classes.)

Contents

CROP COMPOSITION: BAMBOO BRAKES

Area: 1591.93 km^2

Schima wallichi	313.276	1.968	5.93	40.121	0.251	3.33
Callicarpa arborea	271.463	1.707	5.14	8.407	0.053	0.70
Quercus species	241.939	1.520	4.58	26.057	0.164	2.16
Gmelina arborea	136.785	0.859	2.59	38.819	0.244	3.22
Castanopsis hystrix	130.081	0.817	2.47	8.668	0.054	0.72
Albizzia lebbek	117.938	0.742	2.23	71.763	0.451	5.95
Albizzia procera	109.206	0.687	2.07	6.785	0.043	0.56
Kydia calycina	98.084	0.617	1.85	4.016	0.026	0.33
Ficus species	95.980	0.602	1.81	18.970	0.119	1.57
Rest of species	3770.620	23.688	71.33	981.946	6.169	81.46
Total	5285.372	33.207	100	1205.552	7.574	100

(Note: The variation in the percentage of stems and volume for different species is due to their varying proportions in different diameter classes.)

CROP COMPOSITION: ALL COMBINED

Area: 11263.90 km^2

Quercus species	32864.046	29.176	14.20	6112.876	5.427	11.84
Castano-psis hystrix	14826 845	13.164	6.40	2190.824	1.945	4.24
Schima wallichi	10388.312	9.223	4.49	2738.990	2.430	5.30

Contents

Castanopsis indica	5896.455	5.234	2.55	613.054	0.544	1.19
Pinus khasya /insularis	4964.510	4.407	2.14	2056.871	1.825	3.99
Ficus species	3470.929	3.082	1.50	1027.520	0.913	1.99
Quercus serrata	3017.063	2.678	1.30	975.181	0.866	1.89
Albizzia lebbek	2955.196	2.623	1.28	549.601	0.488	1.06
Alnus nepalensis	2862.337	2.541	1.23	898.444	0.799	1.74
Kydia calycina	2314.695	2.055	1.00	247.678	0.220	0.47
Gmelina arborea	1706.664	1.515	0.78	721.609	0.640	1.39
Dipterocarpus turbinatus	1650.417	1.466	0.73	1186.507	1.052	2.30
Rest of species	144563.134	128.341	62.40	32285.575	28.665	62.60
Total	231481.103	205.505	100	51604.730	45.814	100

(Note: The variation in the percentage of stems and volume for different species is due to their varying proportions in different diameter classes.)

The study of all these tables will indicate that the species have been arranged in different crop compositions according to their total number of stems. Generally species representing one percent and more number of stems are considered for this study. The volumes of these species have also been noted against each species. It will reveal that except in case of Conifers the percentage of stems per ha. and percentage of volume per ha. do not follow the similar trend. The main reason for this is that large areas were subjected to shifting cultivation in the past which have produced abundant young crop or bamboos. Thus the number of stems in many cases is more but the corresponding volume is not proportionately more. A close study of number of stems and volume by different diameter classes will point out that the distribution of stems in different diameter classes is uneven or in varying proportions.

Some of the species found in majority are discussed herewith:

1) Pinus khasya/ insularis:- It represents 2.14% of total stems and 3.99% of total volume. It's occurrence is obviously maximum in Conifer crop composition but it is seen in a smaller extent in lowland hardwoods and upland hardwoods. The distribution of stems in different diameter classes shows that maximum stocking is in diameter classes 10-15 cm. to 40-50 cm. The proportion of stock in upper diameter classes is very low (1.70%) while the contribution of volume by upper diameter classes is 13.15%.

2) Quercus species: This species occurs in all crop compositions but it is maximum in lowland hardwoods. It contributes 14.20% stems and 11.84% volume. The number of stems decrease towards upper diameter classes but the volume spread in different diameter classes is even.

3) Castanopsis hystrix: This species also occurs on considerable scale in all crop compositions. It's total volume is 2190824 cu.m. or 4.24% of total volume.

4) Schima wallichi: This species is more common in lowland hardwoods and upland hadrdwoods and Bamboo brakes. Its volume contribution is 5.30% of the total volume.

5) Dipterocarpus turbinatus: The species is more common in lowland hardwood. It's total volume is 1186507 cu.m. i.e. 2.30% of the total volume. Although it represents low percentage in number of stems(0.73%) its volume contribution is more due to its height and larger proportion of bigger diameter classes.

6) Amongst other species in majority the volume contribution by different species is as under:

Castanopsis indica - 1.19%, Ficus species 1.99%, Quercus serrata - 1.89%, Albizzia lebbek -1.06%, Alnus nepalensis - 1.74%, Kydia calycina-0.47% and Gmelina arborea-1.39%. The group 'Rest of the species' contributes 62.60% of the volume.

6.4 TOTAL VOLUME AND STANDARD ERROR PERCENTAGE

The following table gives a summary of total volume by crop compositions and the standard error percentage in each estimate.

6.4T

VOLUME AND STANDARD ERROR BY CROP COMPOSITIONS FOR ENTIRE STATE

Crop composition	Area Km^2	SE%	Vol/ha. cu.m.	SE%	Total volume cu.m.	SE%
Conifers	198.38	19.56	71.440	22.28	1417.160	29.65
Low land hardwood	8348.28	2.32	48.802	6.05	40742.516	6.48
Upland hardwood	1125.31	8.65	73.217	16.16	8239.502	18.33
Bamboo brakes	1591.93	7.78	7.754	28.96	1205.552	29.99
Total	11263.90	2.33	45.814	5.50	51604.730	5.97

6.5 COMPARISON OF ESTIMATES OF PREVIOUS SURVEY RESULTS WITH THOSE OF PRESENT SURVEY:

The Pre-investment Survey of Forest Resources, Central Zone, Nagpur(This is the former name of the present Forest Survey of India, Central Zone, Nagpur) carried out survey of forest resources of Manipur during the year 1975 and brought out the report of the same during the year 1976. The results of the previous survey and the present survey are tabulated below:

Contents

6.5T

RESULTS OF TWO SURVEYS

S.No.	Particulars	Year of survey 1975	1988
1)	Forest area dealt with km^2	15154.94	15154.00
2)	Forest vegetated area	11739.95	11263.90
3)	Estimation of total stems in thousands	~~211660.607~~ 248015.309	231481.103
4)	Estimation of total volume in thousand cubic metres	~~72411.400~~ 108315.913	51604.730

The above table suggests that the areas tackled in the two surveys are same. The forest vegetated area has reduced from 11739.95 km^2 to 11263.90 km^2 during last thirteen years. Although the number of stems are on increase the total volume has fallen considerably (X) The main reason that appears for such variation is over utilisation of the forest by increasing population for the purposes of firewood, cultivation in forest areas and shifting cultivation during last thirteen years.

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(X) There is drastic reduction of stand and growing stock (Nearly be 50%) from 1975 to 1988 i.e. over a period of 13 years.

Contents

TABLE NO. 6.0.1T(A)

CROP COMPOSITION - LOWLAND HARDWOOD STEMS (000) DISTT. IMPHAL, THOUBAL & BISHNUPUR AREA - 125.88 Km2

Species Description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia procera	0.000	0.000	0.000	5.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.035
Callicarpa arborea	40.282	25.176	5.035	5.035	0.000	0.000	5.035	0.000	0.000	0.000	0.000	80.563
Ficus species	25.176	5.035	5.035	0.000	0.000	0.000	5.035	0.000	0.000	0.000	0.000	40.282
Gmelina arborea	20.141	20.141	5.035	0.000	5.035	0.000	5.035	0.000	0.000	0.000	0.000	55.387
Grewia tiliaefolia	10.070	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.070
Macaranga denticulata	5.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.035
Quercus species	35.246	10.070	0.000	5.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000	50.352
Schima wallichi	50.352	45.317	25.176	5.035	0.000	5.035	5.035	0.000	0.000	0.000	0.000	135.950
Rest of species	845.913	387.710	171.197	110.774	70.493	50.352	25.176	20.141	5.035	5.035	0.000	1691.826
All species total	1032.216	493.449	211.478	130.915	75.528	55.387	45.317	20.141	5.035	5.035	0.000	2074.500

Table no. 6.0.1T(B)

CROP COMPOSITION - LOWLAND HARDWOOD STEMS/HA. DISTT. IMPHAL, THOUBAL AND BISHNUPUR AREA -125.88 Km2

Species Description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia procera	0.000	0.000	0.000	0.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.400
Callicarpa arborea	3.200	2.000	0.400	0.400	0.000	0.000	0.400	0.000	0.000	0.000	0.000	6.400
Ficus species	2.000	0.400	0.400	0.000	0.000	0.000	0.400	0.000	0.000	0.000	0.000	3.200
Gmelina arborea	1.600	1.600	0.400	0.000	0.400	0.000	0.400	0.000	0.000	0.000	0.000	4.400
Grewia tiliaefolia	0.800	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.800
Macaranga denticulata	0.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.400
Quercus species	2.800	0.800	0.000	0.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.000
Schima wallichi	4.000	3.600	2.000	0.400	0.000	0.400	0.400	0.000	0.000	0.000	0.000	10.800
Rest of species	67.200	30.800	13.600	8.800	5.600	4.000	2.000	1.600	0.400	0.400	0.000	134.400
All species total	82.000	39.200	16.800	10.400	6.000	4.400	3.600	1.600	0.400	0.400	0.000	164.800

Contents

Table no. 6.0.2T(A)

CROP COMPOSITION - BAMBOO BRAKES STEMS(000) DISTT . IMPHAL, THOUBAL & BISHNUPUR AREA - 157.36 KM2

Species Description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	17.484	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	17.484
Ficus species	8.742	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.742
Gmelina arborea	4.371	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.371
Grewia tiliaefolia	8.742	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.742
Michelia champaca	0.000	0.000	0.000	0.000	4.371	0.000	0.000	0.000	0.000	0.000	0.000	4.371
Quercus species	0.000	8.742	4.371	4.371	0.000	0.000	0.000	0.000	0.000	0.000	0.000	17.484
Schima wallichi	4.371	4.371	8.742	4.371	0.000	4.371	0.000	4.371	0.000	0.000	0.000	30.598
Rest of species	87.422	87.422	13.113	13.113	8.742	0.000	4.371	0.000	4.371	0.000	0.000	218.556
All species total	131.133	100.536	26.227	21.856	13.113	4.371	4.371	4.371	4.371	0.000	0.000	310.349

Table no. 6.0.2.T(B)

CROP COMPOSITION - BAMBOO BRAKES STEMS /HA. DISTT. IMPHAL; THOUBAL & BISHNUPUR AREA - 157.36 KM2

Species Description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	1.111	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	1.111
Ficus species	0.556	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.556
Gmelina arborea	0.278	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.278
Grewia tiliaefolia	0.556	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.556
Micheli champaca	0.000	0.000	0.000	0.000	0.278	0.000	0.000	0.000	0.000	0.000	0.000	0.278
Quercus species	0.000	0.556	0.278	0.278	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.111
Schima wallichi	0.278	0.278	0.556	0.278	0.000	0.278	0.000	0.278	0.000	0.000	0.000	1.944
Rest of species	5.556	5.556	0.833	0.833	0.556	0.000	0.278	0.000	0.278	0.000	0.000	13.889
All species total	8.333	6.389	1.667	1.389	0.833	0.278	0.278	0.278	0.278	0.000	0.000	19.722

Contents

Table No: 6.0.3.T(A)

CROP COMPOSITION - CONIFERS STEM (000) DISTT: SENAPATI AREA - 37.72 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Castanopsis hystrix	25.140	12.570	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	37.710
Kydia calycina	6.285	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.285
Pinus khasya/insularis	100.560	106.845	125.700	81.705	18.855	6.285	25.140	18.855	6.285	6.285	0.000	496.514
Quercus species	37.710	56.565	43.995	12.570	18.855	12.570	0.000	0.000	0.000	0.000	0.000	182.265
Rest of species	100.560	43.995	37.710	12.570	0.000	6.285	6.285	0.000	0.000	0.000	0.000	207.405
All species total	270.255	219.975	207.405	106.845	37.710	25.140	31.425	18.855	6.285	6.285	0.000	930.179

Table No. 6.0.3.T(B)

CROP COMPOSITION - CONIFERS STEMS/HA. DISTT: SENAPATI AREA - 37.72 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Castanopsis hystrix	6.667	3.333	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.000
Kydia calycina	1.667	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.667
Pinus khasya/insularis	26.667	28.333	33.333	21.667	5.000	1.667	6.667	5.000	1.667	1.667	0.000	131.667
Quercus species	10.000	15.000	11.667	3.333	5.000	3.333	0.000	0.000	0.000	0.000	0.000	48.333
Rest of species	26.667	11.667	10.000	3.333	0.000	1.667	1.667	0.000	0.000	0.000	0.000	55.000
All species total	71.667	58.333	55.000	28.333	10.000	6.667	8.333	5.000	1.667	1.667	0.000	246.666

Contents

Table No: 6.0.4.T(A)

CROP COMPOSITION - LOWLAND HARDWOOD STEM (000) DISTT: SENAPATI AREA -729.20 Km2

Species description	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
	Diameter classes in cm.											
Albizzia lebbek	138.164	84.434	23.027	0.000	0.000	7.676	15.352	0.000	0.000	0.000	0.000	268.652
Albizzia procera	30.703	7.676	0.000	7.676	0.000	0.000	0.000	0.000	0.000	0.000	0.000	46.055
Alnus nepalensis	330.059	138.164	46.055	7.676	7.676	15.352	30.703	7.676	0.000	0.000	7.676	591.035
Bridelia retusa	15.352	15.352	0.000	7.676	0.000	0.000	0.000	0.000	0.000	0.000	0.000	38.379
Callicarpa arborea	7.676	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.676
Castanopsis hystrix	752.227	268.652	115.137	84.434	53.731	46.055	15.352	0.000	0.000	0.000	0.000	1335.586
Castanopsis indica	61.406	23.027	30.703	0.000	30.703	7.676	7.676	0.000	0.000	0.000	0.000	161.191
Ficus species	284.004	69.082	23.027	15.352	0.000	0.000	0.000	0.000	0.000	0.000	0.000	391.465
Grewia tiliaefolia	53.731	46.055	7.676	23.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	130.488
Kydia calycina	199.570	76.758	15.352	7.676	7.676	15.352	0.000	0.000	0.000	0.000	0.000	322.387
Michelia champaca	7.676	7.676	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	15.352
Pinus khasya/ insularis	7.676	30.703	46.055	30.703	7.676	0.000	7.676	0.000	0.000	0.000	0.000	130.488
Quercus species	1657.970	660.118	276.328	191.895	115.137	53.731	15.352	0.000	0.000	0.000	0.000	2970.529
Schima wallichi	260.977	61.406	23.027	15.352	7.676	7.676	0.000	0.000	0.000	0.000	0.000	376.113
Rest of species	3699.729	1481.427	629.415	368.438	153.516	92.109	122.813	15.352	38.379	15.352	15.352	6631.679
All species total	7506.918	2970.529	1235.801	759.903	383.789	245.625	214.922	23.027	38.379	15.352	23.027	13417.270

Contents

Table No: 6.0.4.T(B)

CROP COMPOSITION - LOWLAND HARDWOOD STEMS/HA. DISTT: SENAPATI AREA - 729.20 km2

Species description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	1.895	1.158	0.316	0.000	0.000	0.105	0.211	0.000	0.000	0.000	0.000	3.684
Albizzia procera	0.421	0.105	0.000	0.105	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.632
Alnus nepalensis	4.526	1.895	0.632	0.105	0.105	0.211	0.421	0.105	0.000	0.000	0.105	8.105
Bridelia retusa	0.211	0.211	0.000	0.105	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.526
Callicarpa arborea	0.105	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.105
Castanopsis hystrix	10.316	3.684	1.579	1.158	0.737	0.632	0.211	0.000	0.000	0.000	0.000	18.316
Castanopsis indica	0.842	0.316	0.421	0.000	0.421	0.105	0.105	0.000	0.000	0.000	0.000	2.211
Ficus species	3.895	0.947	0.316	0.211	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.368
Grewia tiliaefolia	0.737	0.632	0.105	0.316	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.789
Kydia calycina	2.737	1.053	0.211	0.105	0.105	0.211	0.000	0.000	0.000	0.000	0.000	4.421
Michelia champaca	0.105	0.105	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.211
Pinus khasya/ insularis	0.105	0.421	0.632	0.421	0.105	0.000	0.105	0.000	0.000	0.000	0.000	1.789
Quercus species	22.737	9.053	3.789	2.632	1.579	0.737	0.211	0.000	0.000	0.000	0.000	40.737
Schima wallichi	3.579	0.842	0.316	0.211	0.105	0.105	0.000	0.000	0.000	0.000	0.000	5.158
Rest of species	50.737	20.316	8.632	5.053	2.105	1.263	1.684	0.211	0.526	0.211	0.211	90.947
All species total	102.947	40.737	16.947	10.421	5.263	3.368	2.947	0.316	0.526	0.211	0.316	184.000

Contents

Table No: 6.0.5.T(A)

CROP COMPOSITION - UPLAND HARDWOOD STEM (000) DISTT: SENAPATI AREA - 320.60 Km2

Species description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	7.820	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.820
Albizzia procera	7.820	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.820
Alnus nepalensis	281.502	140.751	31.278	39.098	7.820	23.459	31.278	23.459	15.639	7.820	7.820	609.920
Castanopsis hystrix	234.585	132.932	31.278	15.639	23.459	0.000	7.820	0.000	0.000	0.000	0.000	445.711
Castanopsis indica	46.917	0.000	0.000	0.000	7.820	0.000	0.000	0.000	0.000	0.000	0.000	54.737
Ficus species	15.639	0.000	7.820	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	23.459
Kydia calycina	15.639	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	15.639
Michalia champaca	7.820	0.000	7.820	0.000	0.000	0.000	0.000	0.000	0.000	7.820	0.000	23.459
Pinus khasya/insularis	54.737	78.195	78.195	39.098	70.376	31.278	15.639	0.000	0.000	0.000	0.000	367.517
Quercus species	336.239	78.195	23.459	23.459	46.917	23.459	15.639	31.278	7.820	7.820	15.639	609.921
Schima wallichi	62.556	15.639	15.639	7.820	15.639	0.000	0.000	0.000	0.000	0.000	0.000	117.293
Rest of species	3362.390	1141.648	398.795	320.600	320.600	242.405	258.044	54.737	46.917	46.917	86.015	6279.043
All species total	4433.660	1587.360	594.282	445.712	492.629	320.600	328.419	109.473	70.376	70.376	109.473	8562.352

Table No: 6.0.5.T(B)

CROP COMPOSITION - UPLAND HARDWOOD STEMS/HA. DISTT: SENAPATI AREA - 320.60 Km

Species description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.244	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.244
Albizzia procera	0.244	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.244
Alnus nepalensis	8.780	4.390	0.976	1.220	0.244	0.732	0.976	0.732	0.488	0.244	0.244	19.024
Castanopsis hystrix	7.317	4.146	0.976	0.488	0.732	0.000	0.244	0.000	0.000	0.000	0.000	13.902
Castanopsis indica	1.463	0.000	0.000	0.000	0.244	0.000	0.000	0.000	0.000	0.000	0.000	1.707
Ficus species	0.488	0.000	0.244	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.732
Kydia calycina	0.488	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.488
Michelia champaca	0.244	0.000	0.244	0.000	0.000	0.000	0.000	0.000	0.000	0.244	0.000	0.732
Pinus khasya/insularis	1.707	2.439	2.439	1.220	2.195	0.976	0.488	0.000	0.000	0.000	0.000	11.463
Quercus species	10.488	2.439	0.732	0.732	1.463	0.732	0.488	0.976	0.244	0.244	0.488	19.024
Schima wallichi	1.951	0.488	0.488	0.244	0.488	0.000	0.000	0.000	0.000	0.000	0.000	3.659
Rest of species	104.878	35.610	12.439	10.000	10.000	7.561	8.049	1.707	1.463	1.463	2.683	195.854
All species total	138.293	49.512	18.537	13.902	15.366	10.000	10.244	3.415	2.195	2.195	3.415	267.073

Contents

Table No. 6.0.6.I(A)

CROP COMPOSITION - LOWLAND HARDWOOD STEM(000) DISTT:CHURACHANDPUR AREA - 2022.95 Km2

Species description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	494.499	269.726	106.767	56.193	67.432	16.858	16.858	0.000	0.000	0.000	0.000	1028.331
Albizzia procera	179.818	106.767	44.954	22.477	11.239	0.000	0.000	0.000	0.000	0.000	0.000	365.254
Alnus nepalensis	5.619	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.619
Bridelia retusa	28.096	22.477	0.000	11.239	0.000	0.000	22.477	11.239	11.239	0.000	0.000	106.767
Callicarpa arborea	561.930	196.676	50.574	11.239	0.000	5.619	11.239	0.000	0.000	0.000	0.000	837.275
Castanopsis hystrix	797.941	516.976	460.783	280.965	101.147	67.432	89.909	11.239	11.239	0.000	0.000	2337.628
Castanopsis indica	89.909	11.239	5.619	5.619	0.000	0.000	5.619	0.000	0.000	0.000	0.000	118.005
Ficus species	786.702	162.960	146.102	56.193	33.716	22.477	50.574	11.239	11.239	11.239	33.716	1326.154
Gmelina arborea	219.153	168.579	168.579	67.432	39.335	39.335	44.954	0.000	11.239	0.000	22.477	781.082
Grewia tiliaefolia	781.083	157.340	95.528	39.335	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1073.286
Kydia calycina	382.112	196.676	67.432	11.239	22.477	0.000	5.619	0.000	0.000	0.000	0.000	685.554
Michelia champaca	0.000	0.000	0.000	11.239	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.239
Pinus khasya/insularis	16.858	0.000	11.239	5.619	22.477	16.858	22.477	11.239	0.000	0.000	11.239	118.005
Quercus serrata	0.000	0.000	0.000	0.000	0.000	0.000	11.239	0.000	0.000	0.000	0.000	11.239
Quercus species	3422.155	1343.013	797.941	314.681	398.970	219.153	146.102	50.574	0.000	0.000	0.000	6692.574
Schima wallichi	1966.756	994.616	387.732	236.011	146.102	112.386	101.147	44.954	11.239	0.000	5.619	4006.561
Rest of species	14902.387	6383.523	2753.458	966.520	1123.860	584.407	730.509	191.056	95.528	134.863	123.625	27989.723
All species total	24635.008	10530.566	5096.703	2095.998	1966.755	1084.525	1258.723	331.539	151.721	146.102	196.676	47494.277

Contents

Table No: 6.0.6.T(B)

CROP COMPOSITION - LOWLAND HARDWOOD STEMS/HA. DISTT:CHURACHANDPUR AREA - 2022.95 Km2

Species description	Diameter class in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	2.444	1.333	0.528	0.278	0.333	0.083	0.083	0.000	0.000	0.000	0.000	5.083
Albizzia procera	0.889	0.528	0.222	0.111	0.056	0.000	0.000	0.000	0.000	0.000	0.000	1.806
Alnus nepalensis	0.028	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.028
Bridelia retusa	0.139	0.111	0.000	0.056	0.000	0.000	0.111	0.056	0.056	0.000	0.000	0.528
Callicarpa arborea	2.778	0.972	0.250	0.056	0.000	0.028	0.056	0.000	0.000	0.000	0.000	4.139
Castanopsis hystrix	3.944	2.556	2.278	1.389	0.500	0.333	0.444	0.056	0.056	0.000	0.000	11.556
Castanopsis indica	0.444	0.056	0.028	0.028	0.000	0.000	0.028	0.000	0.000	0.000	0.000	0.587
Ficus species	3.889	0.806	0.722	0.278	0.167	0.111	0.250	0.056	0.056	0.056	0.167	6.556
Gmelina arborea	1.083	0.833	0.833	0.333	0.194	0.194	0.222	0.000	0.056	0.000	0.111	3.861
Grewia tiliaefolia	3.861	0.778	0.472	0.194	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.306
Kydia calycina	1.889	0.972	0.333	0.056	0.111	0.000	0.028	0.000	0.000	0.000	0.000	3.389
Michelia champaca	0.000	0.000	0.000	0.056	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.056
Pinus khasya/insularis	0.083	0.000	0.056	0.028	0.111	0.083	0.111	0.056	0.000	0.000	0.056	0.583
Quercus serrata	0.000	0.000	0.000	0.000	0.000	0.000	0.056	0.000	0.000	0.000	0.000	0.056
Quercus species	16.917	6.639	3.944	1.556	1.972	1.083	0.722	0.250	0.000	0.000	0.000	33.083
Schima wallichi	9.722	4.917	1.917	1.167	0.722	0.556	0.500	0.222	0.056	0.000	0.028	19.805
Rest of species	73.667	31.556	13.611	4.778	5.556	2.889	3.611	0.944	0.472	0.667	0.611	138.361
All species total	121.778	52.056	25.194	10.361	9.722	5.361	6.222	1.639	0.750	0.722	0.972	234.777

Contents

Table No: 6.0.7.T(A)

CROP COMPOSITION - UPLAND HARDWOOD STEM (000) DISTT: CHURACHANDPUR AREA - 58.76 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Castanopsis hystrix	235.040	117.520	88.140	29.360	0.000	0.000	0.000	0.000	0.000	0.000	0.000	470.080
Ficus species	14.690	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.690
Grewia tiliaefolia	29.380	0.000'	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	29.380
Quercus species	117.520	44.070	29.380	0.000	0.000	29.380	0.000	0.000	0.000	0.000	0.000	220.350
Schima wallichi	44.070	14.690	14.690	0.000	14.690	14.690	0.000	0.000	0.000	0.000	0.000	102.830
Rest of species	940.160	381.940	122.210	73.450	44.070	58.760	29.380	0.000	14.690	29.380	0.000	1704.039
All species total	1380.859	558.220	264.420	102.830	58.760	102.830	29.380	0.000	14.690	29.380	0.000	2541.350

Table No: 6.0.7.T(B)

CROP COMPOSITION - UPLAND HARDWOOD STEMS/HA. DISTT: CHURACHANDPUR AREA - 56.76 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Castanopsis hystrix	40.000	20.000	15.000	5.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	80.000
Ficus species	2.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.500
Grewia tiliaefolia	5.000	0.000'	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.000
Quercus species	20.000	7.500	5.000	0.000	0.000	5.000	0.000	0.000	0.000	0.000	0.000	37.500
Schima wallichi	7.500	2.500	2.500	0.000	2.500	2.500	0.000	0.000	0.000	0.000	0.000	17.500
Rest of species	160.000	65.000	22.500	12.500	7.500	10.000	5.000	0.000	2.500	5.000	0.000	290.009
All species total	235.000	95.000	45.000	17.500	10.000	17.500	5.000	0.000	2.500	5.000	0.000	432.500

Contents

Table No. 6.0.8.T(A)

CROP COMPOSITION - BAMBOO BRAKES STEM (000) DISTT: CHURACHANDPUR AREA - 688.31 Km2

Species description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	9.429	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.429
Callicarpa arborea	202.721	18.858	9.429	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	231.008
Castanopsis hystrix	9.429	0.000	0.000	9.429	0.000	0.000	0.000	0.000	0.000	0.000	0.000	18.858
Ficus species	42.430	4.714	0.000	9.429	0.000	0.000	9.429	0.000	0.000	0.000	0.000	66.002
Gmelina arborea	37.716	9.429	9.429	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	56.573
Grewia tiliaefolia	9.429	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.429
Quercus species	18.858	0.000	9.429	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	28.287
Schima wallichi	80.146	18.858	0.000	9.429	9.429	0.000	0.000	0.000	0.000	0.000	0.000	117.861
Rest of species	924.032	306.439	165.006	103.718	113.147	28.287	66.002	37.716	4.714	18.858	28.287	1796.205
All species total	1334.189	358.298	193.292	132.005	122.576	28.287	75.431	37.716	4.714	18.858	28.287	2333.651

Table No. 6.0.8.T(B)

CROP COMPOSITION - BAMBOO BRAKES STEMS/HA. DISTT: CHURACHANDPUR AREA - 688.31 Km2

Species description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.137	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.137
Callicarpa arborea	2.945	0.274	0.137	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.356
Castanopsis hystrix	0.137	0.000	0.000	0.137	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.274
Ficus species	0.616	0.068	0.000	0.137	0.000	0.000	0.137	0.000	0.000	0.000	0.000	0.959
Gmelina arborea	0.548	0.137	0.137	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.822
Grewia tiliaefolia	0.137	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.137
Quercus species	0.274	0.000	0.137	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.411
Schima wallichi	1.164	0.274	0.000	0.137	0.137	0.000	0.000	0.000	0.000	0.000	0.000	1.712
Rest of species	13.425	4.452	2.397	1.507	1.644	0.411	0.959	0.548	0.068	0.274	0.411	26.096
All species total	19.384	5.205	2.808	1.918	1.781	0.411	1.096	0.548	0.068	0.274	0.411	33.904

Contents

Table No:.6.0.9.T(A)

CROP COMPOSITION - CONIFERS STEMS (000) DISTT: UKHRUL AREA - 122.05 Km2

Species description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	69-70	70-80	80+	Total
Castanopsis hystrix	61.025	22.884	22.884	7.628	15.256	0.000	7.628	0.000	0.000	0.000	0.000	137.306
Castanopsis indica	7.628	7.628	0.000	0.000	7.628	7.628	0.000	0.000	0.000	0.000	0.000	30.512
Kydia calycina	22.884	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	22.884
Pinus khasya/insularis	289.869	594.994	511.084	305.125	213.587	129.678	99.166	0.000	0.000	0.000	0.000	2143.502
Quercus species	221.216	61.025	15.256	15.256	7.628	0.000	22.884	0.000	0.000	0.000	0.000	343.265
Schima wallichi	22.884	7.628	0.000	7.628	7.628	0.000	0.000	0.000	0.000	0.000	0.000	45.769
Rest of species	549.225	190.703	106.794	68.653	68.653	22.884	22.884	0.000	0.000	0.000	0.000	1029.796
All species total	1174.731	884.862	656.018	404.290	320.381	160.191	152.562	0.000	0.000	0.000	0.000	3753.035

Table No: 6.0.9.T(B)

CROP COMPOSITION - CONIFERS STEMS/HA. DISTT: UKHRUL AREA - 122.05 Km2

Species description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Castanopsis hystrix	5.000	1.875	1.875	0.625	1.250	0.000	0.625	0.000	0.000	0.000	0.000	11.250
Castanopsis indica	0.625	0.625	0.000	0.000	0.625	0.625	0.000	0.000	0.000	0.000	0.000	2.500
Kydia calycina	1.875	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.875
Pinus khasya/insularis	23.750	48.750	41.875	25.000	17.500	10.625	8.125	0.000	0.000	0.000	0.000	175.625
Quercus species	18.125	5.000	1.250	1.250	0.625	0.000	1.875	0.000	0.000	0.000	0.000	28.125
Schima wallichi	1.875	0.625	0.000	0.625	0.625	0.000	0.000	0.000	0.000	0.000	0.000	3.750
Rest of species	45.000	15.625	8.750	5.625	5.625	1.875	1.875	0.000	0.000	0.000	0.000	84.375
All species total	96.250	72.500	53.750	33.125	26.250	13.125	12.500	0.000	0.000	0.000	0.000	307.500

Contents

Table No: 6.0.10.T(A)

CROP COMPOSITION - LOWLAND HARDWOOD STEM (000) DISTT:UKHRUL AREA - 1539.14 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	170.115	105.310	24.302	24.302	0.000	8.101	0.000	8.101	0.000	0.000	0.000	340.230
Albizzia procera	153.904	56.705	32.403	72.907	0.000	8.101	8.101	0.000	0.000	0.000	0.000	332.130
Alnus nepalensis	226.821	162.015	8.101	8.101	8.101	0.000	8.101	0.000	8.101	0.000	0.000	429.338
Bridelia retusa	81.007	8.101	8.101	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	97.209
Callicarpa arborea	145.813	24.302	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	170.115
Castanopsis hystrix	955.887	291.626	97.209	24.302	8.101	16.201	24.302	0.000	0.000	0.000	0.000	1417.628
Castanopsis indica	2648.940	850.577	291.626	121.511	72.907	32.403	32.403	0.000	0.000	0.000	8.101	4058.468
Dipterocarpus turbinatus	113.410	105.310	89.108	56.705	56.705	56.705	48.604	16.201	16.201	0.000	0.000	558.950
Ficus species	348.332	121.511	56.705	32.403	8.101	0.000	16.201	0.000	8.101	0.000	0.000	591.353
Gmelina arborea	81.007	89.108	8.101	8.101	8.101	0.000	8.101	0.000	8.101	0.000	0.000	210.619
Grewia tiliaefolia	210.619	24.302	16.201	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	251.123
Kydia calycina	291.626	105.310	89.108	16.201	0.000	0.000	0.000	0.000	0.000	0.000	0.000	502.245
Michelia champaca	16.201	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	16.201
Pinus khasya/insularis	89.108	40.504	48.604	105.310	105.310	32.403	40.504	0.000	0.000	16.201	8.101	486.043
Quercus serrata	850.577	437.440	243.022	113.410	129.612	56.705	56.705	8.101	8.101	0.000	0.000	1903.672
Quercus species	2770.451	955.887	388.835	186.317	72.907	56.705	48.604	0.000	0.000	0.000	0.000	4479.699
Schima wallichi	372.634	145.813	40.504	8.101	24.302	0.000	16.201	8.101	0.000	0.000	0.000	615.655
Rest of species	12337.418	4414.898	1652.550	769.570	680.462	453.641	332.130	145.813	81.007	56.705	48.604	20972.781
All species total	21863.859	7938.715	3094.430	1547.240	1174.606	720.965	639.959	186.317	129.612	72.907	64.806	37433.445

Contents

Table No: 6.0.10.T(B)

CROP COMPOSITION - LOWLAND HARDWOOD STEMS/HA. DISTT: UKHRUL AREA - 15[illegible].14 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	1.105	0.684	0.158	0.158	0.000	0.053	0.000	0.053	0.000	0.000	0.000	2.211
Albizzia procera	1.000	0.368	0.211	0.474	0.000	0.053	0.053	0.000	0.000	0.000	0.000	2.158
Alnus napalensis	1.474	1.053	0.053	0.053	0.053	0.000	0.053	0.000	0.053	0.000	0.000	2.789
Bridelia retusa	0.526	0.053	0.053	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.632
Callicarpa arborea	0.947	0.158	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.105
Castanopsis hystrix	6.211	1.895	0.632	0.158	0.053	0.105	0.158	0.000	0.000	0.000	0.000	9.211
Castanopsis indica	17.211	5.526	1.895	0.789	0.474	0.211	0.211	0.000	0.000	0.000	0.053	26.368
Dipterocarpus turbinatus	0.737	0.684	0.579	0.368	0.368	0.368	0.316	0.105	0.105	0.000	0.000	3.632
Ficus species	2.263	0.789	0.368	0.211	0.053	0.000	0.105	0.000	0.053	0.000	0.000	3.842
Gmelina arborea	0.526	0.579	0.053	0.053	0.053	0.000	0.053	0.000	0.053	0.000	0.000	1.368
Grewia tiliaefolia	1.368	0.158	0.105	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.632
Kydia calycina	1.895	0.684	0.579	0.105	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.263
Michelia champaca	0.105	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.105
Pinus khasya/insularis	0.579	0.263	0.316	0.684	0.684	0.211	0.263	0.000	0.000	0.105	0.053	3.158
Quercus serrata	5.526	2.842	1.579	0.737	0.842	0.368	0.368	0.053	0.053	0.000	0.000	12.368
Quercus species	18.000	6.211	2.526	1.211	0.474	0.368	0.316	0.000	0.000	0.000	0.000	29.105
Schima wallichi	2.421	0.947	0.263	0.053	0.158	0.000	0.105	0.053	0.000	0.000	0.000	4.000
Rest of species	80.158	28.684	10.737	5.000	4.421	2.947	2.158	0.947	0.526	0.368	0.316	136.263
All species total	142.053	51.579	20.105	10.053	7.632	4.684	4.158	1.211	0.842	0.474	0.421	243.210

Contents

Table No: 6.0.11.T(A)

CROP COMPOSITION - UPLAND HARDWOOD STEM(000) DISTT:UKHRUL AREA - 406.82 Km2

Species description	Diameter classes in cm. 10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	40.682	32.546	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	73.228
Alnus nepalensis	154.892	65.091	8.136	8.136	16.273	16.273	0.000	0.000	0.000	0.000	0.000	268.501
Bridelia retusa	8.136	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.136
Castanopsis hystrix	301.047	89.500	32.546	0.000	0.000	0.000	24.409	0.000	0.000	0.000	0.000	447.501
Castanopsis indica	97.637	40.682	32.546	0.000	0.000	0.000	8.136	0.000	0.000	0.000	0.000	179.001
Ficus species	48.818	16.273	16.273	24.409	8.136	8.136	16.273	0.000	0.000	0.000	0.000	138.319
Gmelina arborea	0.000	8.136	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.136
Kydia calycina	16.273	8.136	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	24.409
Michelia champaca	0.000	0.000	0.000	0.000	0.000	8.136	0.000	0.000	0.000	0.000	0.000	8.136
Pinus khasya/insularis	162.728	73.228	81.364	48.818	48.818	97.637	81.364	0.000	0.000	0.000	0.000	593.957
Quercus serrata	154.592	97.637	48.818	32.546	16.273	16.273	24.409	0.000	0.000	8.136	0.000	398.683
Quercus species	187.137	32.546	8.136	16.273	0.000	0.000	0.000	0.000	0.000	0.000	0.000	244.092
Schima wallichi	89.500	56.955	16.273	0.000	0.000	16.273	16.273	0.000	0.000	0.000	0.000	195.274
Rest of species	2432.784	1220.460	496.320	341.729	211.546	113.910	146.455	8.136	16.273	0.000	8.136	4995.727
All species total	3693.925	1741.189	740.412	471.911	301.047	276.637	317.320	8.136	16.273	8.136	8.136	7583.098

Table No: 6.0.11.T(B)

CROP COMPOSITION - UPLAND HARDWOOD STEMS/HA. DISTT:UKHRUL AREA - 406.82 Km2

Species description	Diameter classes in cm. 10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	1.000	0.800	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.800
Alnus nepalensis	3.800	1.600	0.200	0.200	0.400	0.400	0.000	0.000	0.000	0.000	0.000	6.600
Bridelia retusa	0.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.200
Castanopsis hystrix	7.400	2.200	0.800	0.000	0.000	0.000	0.600	0.000	0.000	0.000	0.000	11.000
Castanopsis indica	2.400	1.000	0.800	0.000	0.000	0.000	0.200	0.000	0.000	0.000	0.000	4.400
Ficus species	1.200	0.400	0.400	0.600	0.200	0.200	0.400	0.000	0.000	0.000	0.000	3.400
Gmelina arborea	0.000	0.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.200
Kydia calycina	0.400	0.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.600
Michelia champaca	0.000	0.000	0.000	0.000	0.000	0.200	0.000	0.000	0.000	0.000	0.000	0.200
Pinus khasya/insularis	4.000	1.800	2.000	1.200	1.200	2.400	2.000	0.000	0.000	0.000	0.000	14.600
Quercus serrata	3.800	2.400	1.200	0.800	0.400	0.400	0.600	0.000	0.000	0.200	0.000	9.800
Quercus species	4.600	0.800	0.200	0.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.000
Schima wallichi	2.200	1.400	0.400	0.000	0.000	0.400	0.400	0.000	0.000	0.000	0.000	4.800
Rest of species	59.800	30.000	12.200	8.400	5.200	2.800	3.600	0.200	0.400	0.000	0.200	122.800
All species total	90.800	42.800	18.200	11.600	7.400	6.800	7.800	0.200	0.400	0.200	0.200	186.400

Contents

Table No. 6.0.12.T(A)

CROP COMPOSITION - LOWLAND HARDWOOD STEMS (000) DISTT: TAMENGLONG AREA - 2135.47 Km2

Species description	Diameter classes in cm. 10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	337.891	162.187	108.125	94.609	67.578	13.516	27.031	13.516	0.000	0.000	0.000	824.453
Albizzia procera	54.063	0.000	0.000	0.000	0.000	0.000	13.516	0.000	0.000	0.000	0.000	67.578
Alnus napalensis	297.344	67.578	13.516	0.000	13.516	13.516	13.516	0.000	0.000	13.516	13.516	446.016
Bridelia retusa	40.547	0.000	40.547	0.000	0.000	13.516	0.000	0.000	13.516	0.000	0.000	108.125
Castanopsis hystrix	256.797	135.156	67.578	0.000	27.031	40.547	81.094	0.000	13.516	0.000	0.000	621.719
Castanopsis indica	13.516	0.000	0.000	0.000	13.516	0.000	0.000	0.000	0.000	0.000	0.000	27.031
Ficus species	162.187	67.578	27.031	0.000	13.516	13.516	0.000	13.516	0.000	0.000	13.516	310.859
Gmelina arborea	202.734	94.609	54.063	40.547	13.516	13.516	13.516	0.000	0.000	0.000	0.000	432.500
Grewia tiliaefolia	67.578	40.547	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	108.125
Kydia calycina	148.672	81.094	81.094	27.031	40.547	0.000	13.516	0.000	0.000	0.000	0.000	391.953
Michelia champaca	229.766	67.578	0.000	13.516	13.516	13.516	0.000	0.000	0.000	0.000	0.000	337.891
Quercus serrata	94.609	13.516	40.547	13.516	0.000	0.000	0.000	0.000	13.516	0.000	0.000	175.703
Quercus species	3068.047	1730.000	865.000	446.016	378.437	310.859	351.406	54.063	54.063	0.000	13.516	7271.406
Schima wallichi	1283.984	743.359	554.141	202.734	189.219	148.672	148.672	94.609	13.516	40.547	27.031	3446.484
Rest of species	12042.422	6257.734	2446.328	1473.203	1243.437	1027.187	865.000	229.766	297.344	94.609	175.703	26152.734
All species total	18300.156	9460.937	4297.969	2311.172	2013.828	1608.359	1527.266	405.469	405.469	148.672	243.281	40722.578

Table No. 6.0.12.T(B)

CROP COMPOSITION - LOWLAND HARDWOOD - STEMS/HA. DISTT: TAMENGLONG AREA - 2135.47 Km2

Species description	Diameter classes in cm. 10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	1.582	0.759	0.506	0.443	0.316	0.063	0.127	0.063	0.000	0.000	0.000	3.861
Albizzia procera	0.253	0.000	0.000	0.000	0.000	0.000	0.063	0.000	0.000	0.000	0.000	0.316
Alnus napalensis	1.392	0.316	0.063	0.000	0.063	0.063	0.063	0.000	0.000	0.063	0.063	2.089
Bridelia retusa	0.190	0.000	0.190	0.000	0.000	0.063	0.000	0.000	0.063	0.000	0.000	0.506
Castanopsis hystrix	1.203	0.633	0.316	0.000	0.127	0.190	0.380	0.000	0.063	0.000	0.000	2.911
Castanopsis indica	0.063	0.000	0.000	0.000	0.063	0.000	0.000	0.000	0.000	0.000	0.000	0.127
Ficus species	0.759	0.316	0.127	0.000	0.063	0.063	0.000	0.063	0.000	0.000	0.063	1.456
Gmelina arborea	0.949	0.443	0.253	0.190	0.063	0.063	0.063	0.000	0.000	0.000	0.000	2.025
Grewia tiliaefolia	0.316	0.190	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.506
Kydia calycina	0.696	0.380	0.380	0.127	0.190	0.000	0.063	0.000	0.000	0.000	0.000	1.835
Michelia champaca	1.076	0.316	0.000	0.063	0.063	0.063	0.000	0.000	0.000	0.000	0.000	1.582
Quercus serrata	0.443	0.063	0.190	0.063	0.000	0.000	0.000	0.000	0.063	0.000	0.000	0.823
Quercus species	14.367	8.101	4.051	2.089	1.772	1.456	1.646	0.253	0.253	0.000	0.063	34.051
Schima wallichi	6.013	3.481	2.595	0.949	0.886	0.696	6.696	0.443	0.063	0.190	0.127	16.139
Rest of species	56.392	29.304	11.456	6.899	5.823	4.810	4.051	1.076	1.392	0.443	0.823	122.468
All species total	85.696	44.304	20.127	10.823	9.430	7.532	7.152	1.899	1.899	0.696	1.139	190.696

Contents

Table No. 6.0.13.T(A)

CROP COMPOSITION - UPLAND HARDWOOD STEMS(000) DISTT: TAMENGLONG AREA - 261.90 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Alnus nepalensis	96.486	55.135	13.784	27.567	0.000	0.000	0.000	13.784	0.000	0.000	0.000	206.755
Ficus species	0.000	13.784	27.567	0.000	0.000	0.000	27.567	0.000	0.000	0.000	0.000	68.918
Kydia calycina	13.784	13.784	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	27.567
Macaranga denticulata	13.784	13.784	0.000	0.000	0.000	0.000	13.784	0.000	0.000	0.000	13.784	55.135
Quercus species	620.265	344.592	124.053	82.702	41.351	41.351	110.269	0.000	13.784	27.567	13.784	1419.717
Schima wallichi	110.269	55.135	41.351	27.567	27.567	0.000	0.000	13.784	0.000	0.000	0.000	275.673
Rest of species	1543.771	799.453	661.616	220.539	206.755	68.918	234.322	82.702	82.702	27.567	68.918	3997.264
All species total	2398.359	1295.665	868.371	358.375	275.673	110.269	385.943	110.269	96.486	55.135	96.486	6061.027

Table No. 6.0.13.T(B)

CROP COMPOSITION - UPLAND HARDWOOD STEMS/HA. DISTT: TAMENGLONG AREA - 261.90 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Alnus nepalensis	3.684	2.105	0.526	1.053	0.000	0.000	0.000	0.526	0.000	0.000	0.000	7.895
Ficus species	0.000	0.526	1.053	0.000	0.000	0.000	1.053	0.000	0.000	0.000	0.000	2.632
Kydia calycina	0.526	0.526	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.053
Macaranga denticulata	0.526	0.526	0.000	0.000	0.000	0.000	0.526	0.000	0.000	0.000	0.526	2.105
Quercus species	23.684	13.158	4.737	3.158	1.579	1.579	4.211	0.000	0.526	1.053	0.526	54.210
Schima wallichi	4.211	2.105	1.579	1.053	1.053	0.000	0.000	0.526	0.000	0.000	0.000	10.526
Rest of species	58.947	30.526	25.263	8.421	7.895	2.632	8.947	3.158	3.158	1.053	2.632	152.632
All species total	91.579	49.474	33.158	13.684	10.526	4.211	14.737	4.211	3.684	2.105	3.684	231.052

Contents

Table No. 6.0.14.T(A)

CROP COMPOSITION - BAMBOO BRAKES STEM(000) DISTT: TAMENGLONG AREA - 533.07 Km2

Species description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia procera	44.489	33.367	11.122	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	88.978
Castanopsis hystrix	77.856	22.245	11.122	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	111.223
Fiscus species	11.122	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.122
Gmelina arborea	0.000	11.122	22.245	0.000	0.000	0.000	22.245	0.000	0.000	0.000	0.000	55.611
Kydia calycina	44.489	33.367	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	77.856
Quercus species	66.734	66.734	0.000	22.245	0.000	0.000	0.000	0.000	0.000	0.000	0.000	155.712
Schima wallichi	88.978	44.489	11.122	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	144.590
Rest of species	411.524	88.978	33.367	77.856	33.367	11.122	44.489	11.122	0.000	0.000	0.000	711.825
All species total	745.193	300.302	88.978	100.101	33.367	11.122	66.734	11.122	0.000	0.000	0.000	1356,917

Table No. 6.0.14.T(B)

CROP COMPOSITION - BAMBOO BRAKES STEMS/HA. DISTT: TAMENGLONG AREA - 533.87 Km2

Species description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia procera	0.833	0.625	0.208	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.667
Castanopsis hystrix	1.458	0.417	0.208	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.083
Fiscus species	0.208	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.208
Gmelina arborea	0.000	0.208	0.417	0.000	0.000	0.000	0.417	0.000	0.000	0.000	0.000	1.042
Kydia calycina	0.833	0.625	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.458
Quercus species	1.250	1.250	0.000	0.417	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.917
Schima wallichi	1.667	0.833	0.208	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.708
Rest of species	7.708	1.667	0.625	1.458	0.625	0.208	0.833	0.208	0.000	0.000	0.000	13.333
All species total	13.958	5.625	1.667	1.875	0.625	0.208	1.250	0.208	0.000	0.000	0.000	25.417

Contents

Table no. 6.0.15.T(A)

CROP COMPOSITION - CONIFERS STEMS (000) DISTT. - CHANDEL AREA - 30.61 Km2

Species Description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Castanopsis hystrix	148.043	64.367	0.000	12.873	32.183	0.000	0.000	0.000	0.000	0.000	0.000	257.466
Kydia calycina	6.437	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.437
Pinus khasya/insularis	6.437	12.873	38.620	51.493	45.057	25.747	25.747	0.000	0.000	0.000	0.000	205.973
Quercus serrata	51.493	25.747	0.000	12.873	12.873	12.873	12.873	0.000	0.000	0.000	0.000	128.733
Quercus species	32.183	32.183	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	64.367
Rest of species	96.550	38.620	0.000	6.437	0.000	0.000	0.000	0.000	0.000	0.000	0.000	141.607
All species total	341.145	173.790	38.620	83.677	90.113	38.620	38.620	0.000	0.000	0.000	0.000	804.582

Table no. 6.0.15.T(B)

CROP COMPOSITION - CONIFERS STEMS/ HA. DISTT. - CHANDEL AREA - 30.61 Km2

Species Description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Castanopsis hystrix	38.333	16.667	0.000	3.333	8.333	0.000	0.000	0.000	0.000	0.000	0.000	66.667
Kydia calycina	1.667	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.667
Pinus khasya/insularis	1.667	3.333	10.000	13.333	11.667	6.667	6.667	0.000	0.000	0.000	0.000	53.333
Quercus serrata	13.333	6.667	0.000	3.333	3.333	3.333	3.333	0.000	0.000	0.000	0.000	33.333
Quercus species	8.333	8.333	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	16.667
Rest of species	25.000	10.000	0.000	1.667	0.000	0.000	0.000	0.000	0.000	0.000	0.000	36.667
All species total	88.333	45.000	10.000	21.667	23.333	10.000	10.000	0.000	0.000	0.000	0.000	208.333

Contents

Table no. 6.0.16T(A)

CROP COMPOSITION - LOWLAND HARDWOOD   STEMS (000)   DISTT. - CHANDEL   AREA - 1795.64 Km2

Species Description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	181.911	41.077	23.472	11.736	11.736	5.868	5.868	0.000	0.000	0.000	0.000	281.668
Albizzia procera	70.417	5.868	23.472	0.000	5.868	0.000	11.736	0.000	0.000	0.000	0.000	117.362
Alnus napalensis	23.472	46.945	46.945	70.417	70.417	11.736	35.209	0.000	0.000	0.000	0.000	305.141
Bridelia retusa	88.022	23.472	11.736	11.736	0.000	0.000	0.000	0.000	0.000	0.000	0.000	134.966
Callicarpa arborea	205.384	23.472	46.945	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	275.801
Castanopsis hystrix	4101.801	1555.047	645.491	328.614	305.141	134.966	93.890	23.472	0.000	0.000	0.000	7188.406
Castanopsis indica	786.325	281.669	117.362	11.736	41.077	11.736	5.868	0.000	0.000	11.736	0.000	1267.509
Diptocarpus turbinatus	281.669	143.834	82.153	70.417	105.626	93.890	164.307	46.945	35.209	35.209	35.209	1091.465
Fiscus species	293.405	64.549	82.153	11.736	0.000	0.000	17.604	0.000	0.000	0.000	0.000	469.448
Gmelina arborea	5.868	17.604	11.736	0.000	23.472	11.736	11.736	0.000	0.000	0.000	0.000	82.153
Grewia tiliaefolia	111.494	76.285	23.472	35.209	5.868	11.736	0.000	0.000	0.000	0.000	0.000	264.064
Kydia calycina	82.153	58.681	17.604	46.945	5.868	0.000	0.000	0.000	0.000	0.000	0.000	211.252
Macaranga denticulata	82.153	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	82.153
Michalia champaca	35.209	23.472	17.604	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	76.285
Pinus khasya/insularis	117.362	52.813	46.945	41.077	29.340	52.813	76.285	5.868	0.000	0.000	0.000	422.502
Quercus serrata	99.758	93.890	23.472	11.736	11.736	41.077	58.681	0.000	35.209	0.000	23.472	399.030
Quercus species	3520.861	1695.881	880.215	487.052	428.371	228.856	88.022	23.472	0.000	0.000	0.000	7352.719
Schima wallichi	340.350	129.098	58.681	35.209	35.209	11.736	35.209	11.736	0.000	0.000	23.472	680.699
Rest of species	14852.160	7687.211	3203.983	1279.246	1214.697	745.249	539.865	269.933	117.362	93.890	105.626	30109.199
All species total	25279.750	12017.867	5363.441	2452.865	2294.426	1361.398	1144.279	381.426	187.779	140.834	187.779	50811.805

Table no. 6.D.16.T(B)

CROP COMPOSITION - LOWLAND HARDWOOD STEMS/HA. DISTT: CHANDEL AREA - 1795.64 KM2

Species description	Diameter classes (in cm.)											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	1.013	0.229	0.131	0.065	0.065	0.033	0.033	0.000	0.000	0.000	0.000	1.569
Albizzia procera	0.392	0.033	0.131	0.000	0.033	0.000	0.065	0.000	0.000	0.000	0.000	0.654
Alnus nepalensis	0.131	0.261	0.261	0.392	0.392	0.065	0.196	0.000	0.000	0.000	0.000	1.699
Bridelia retusa	0.490	0.131	0.065	0.065	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.752
Callicarpa arborea	1.144	0.131	0.261	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.536
Castanopsis hystrix	22.843	8.660	5.595	1.830	1.699	0.752	0.523	0.131	0.000	0.000	0.000	40.033
Castanopsis indica	4.379	1.569	0.654	0.065	0.229	0.065	0.033	0.000	0.000	0.065	0.000	7.059
Dipterocarpus turbinatus	1.569	0.784	0.458	0.392	0.588	0.523	0.915	0.261	0.196	0.196	0.196	6.078
Ficus species	1.634	0.359	0.458	0.065	0.000	0.000	0.098	0.000	0.000	0.000	0.000	2.614
Gmelina arborea	0.033	0.098	0.065	0.000	0.131	0.065	0.065	0.000	0.000	0.000	0.000	0.458
Grewia tiliaefolia	0.631	0.425	0.131	0.196	0.033	0.065	0.000	0.000	0.000	0.000	0.000	1.471
Kydia calycina	0.458	0.327	0.098	0.261	0.033	0.000	0.000	0.000	0.000	0.000	0.000	1.176
Macaranga denticulata	0.458	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.458
Michelia champaca	0.196	0.131	0.098	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.425
Pinus khasya/insularis	0.654	0.294	0.261	0.229	0.163	0.294	0.425	0.033	0.000	0.000	0.000	2.353
Quercus serrata	0.556	0.523	0.131	0.065	0.065	0.229	0.327	0.000	0.196	0.000	0.131	2.222
Quercus species	19.608	9.444	4.902	2.712	2.386	1.275	0.490	0.131	0.000	0.000	0.000	40.948
Schima wallichi	1.895	0.719	0.327	0.196	0.196	0.065	0.196	0.065	0.000	0.000	0.131	3.791
Rest of species	82.712	42.810	17.843	7.124	6.765	4.150	3.007	1.503	0.654	0.523	0.588	157.680
All species total	140.784	66.928	29.869	13.660	12.778	7.552	6.373	2.124	1.046	0.784	1.046	282.973

Contents

Table no. 6.0.17.T(A)

CROP COMPOSITION - UPLAND HARDWOOD   STEMS (000)   DISTT. CHANDEL   AREA 77.23 Km2

Species Description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.000	0.000	0.000	12.872	0.000	0.000	0.000	0.000	0.000	0.000	0.000	12.872
Quercus species	347.535	205.947	25.743	77.230	25.743	25.743	12.872	0.000	0.000	0.000	0.000	720.812
Schima wallichi	12.872	12.872	0.000	12.872	12,872	0.000	12.872	12.872	0.000	0.000	0.000	77.230
Rest of species	1531.727	913.887	347.535	154.460	128.717	51.487	25.743	25.743	12.872	0.000	12.872	3205.042
All species total	1892.133	1132.706	373.278	257.433	167.331	77.230	51.487	38.615	12.872	0.000	12.872	4015.955

Table no. 6.0.17.T(B)

CROP COMPOSITION - UPLAND HARDWOOD   STEMS/HA.   DISTT. - CHANDEL   AREA - 77.23 Km2

Species Description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.000	0.000	0.000	1.667	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.667
Quercus species	45.000	26.667	3.333	10.000	3.333	3.333	1.667	0.000	0.000	0.000	0.000	93.333
Schima wallichi	1.667	1.667	0.000	1.667	1.667	0.000	1.667	1.667	0.000	0.000	0.000	10.000
Rest of species	198.333	118.333	45.000	20.000	16.667	6.667	3.333	3.333	1.667	0.000	1.667	414.999
All species total	245.000	146.667	48.333	33.333	21.667	10.000	6.667	5.000	1.667	0.000	1.667	519.998

Table no. 6.0.18.T(A)

CROP COMPOSITION - BAMBOO BRAKES STEMS(000) DISTT.- CHANDEL AREA - 212.39 Km2

Species Description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	30.341	0.000	20.228	0.000	0.000	20.228	0.000	10.114	10.114	0.000	0.000	91.024
Albizzia procera	20.228	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	20.228
Callicarpa arborea	30.341	10.114	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	40.455
Ficus species	0.000	10.114	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.114
Gmelina arborea	20.228	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	20.228
Grewia tiliaefolia	10.114	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.114
Kydia calycina	20.228	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	20.228
Quercus species	10.114	30.341	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	40.455
Schima wallichi	0.000	0.000	10.114	10.114	0.000	0.000	0.000	0.000	0.000	0.000	0.000	20.228
Rest of species	566.373	182.048	80.910	40.455	50.569	30.341	50.569	10.114	0.000	0.000	0.000	1011.379
All species total	707.966	232.617	111.252	50.569	50.569	50.569	50.569	20.228	10.114	0.000	0.000	1284.452

Table no. 6.0.18.T(B)

CROP COMPOSITION - BAMBOO BRAKES STEMS/HA. DISTT. - CHANDEL AREA - 212.39 Km2

Species Description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	1.429	0.000	0.952	0.000	0.000	0.952	0.000	0.476	0.476	0.000	0.000	4.286
Albizzia procera	0.952	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.952
Callicarpa arborea	1.429	0.476	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.905
Ficus species	0.000	0.476	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.476
Gmelina arborea	0.952	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.952
Grewia tiliaefolia	0.476	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.476
Kydia calycina	0.952	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.952
Quercus species	0.476	1.429	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.905
Schima wallichi	0.000	0.000	0.476	0.476	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.952
Rest of species	26.667	8.571	3.810	1.905	2.381	1.429	2.381	0.476	0.000	0.000	0.000	47.619
All species total	33.333	10.952	5.238	2.381	2.381	2.381	2.381	0.952	0.476	0.000	0.000	60.476

Contents

Table No. 6.0.19.T(A)

CROP COMPOSITION - CONIFERS STEMS(000) ENTIRE STATE AREA - 198.38 Km2

Species Name	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Albizzia procera	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alnus nepalensis	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Bridelia retusa	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Callicarpa arborea	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Castanopsis hystrix	234.208	99.821	22.684	20.501	47.439	0.000	7.628	0.000	0.000	0.000	0.000	432.481
Castanopsis indica	7.628	7.628	0.000	0.000	7.628	7.628	0.000	0.000	0.000	0.000	0.000	30.512
Dipterocarpus turbinatus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ficus species	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Gmelina arborea	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Grewia tiliaefolia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Kydia calycina	35.606	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	35.606
Lagerstroemia flosreginae	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Macaranga denticulata	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Michalia champaca	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pinus khasya/ insularis	396.866	714.712	675.404	438.323	277.499	161.710	150.053	18.855	6.285	6.285	0.000	2845.992
Quercus serrata	51.493	25.747	0.000	12.873	12.873	12.873	12.873	0.000	0.000	0.000	0.000	128.732
Quercus species	291.109	149.773	59.251	27.926	26.483	12.570	22.884	0.000	0.000	0.000	0.000	589.896
Schima wallichi	22.884	7.628	0.000	7.628	7.628	0.000	0.000	0.000	0.000	0.000	0.000	45.768
Rest of species	746.335	273.318	144.504	87.660	68.653	29.169	29.169	0.000	0.000	0.000	0.000	1378.808
All species total	1786.129	1273.627	902.043	594.311	448.203	223.950	222.607	18.855	6.285	6.285	0.000	5482.795

Contents

Table No. 6.0.19.T.(B)

CROP COMPOSITION - CONIFERS STEMS/HA. ENTIRE STATE AREA - 198.38 Km2

Species Name	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Albizzia procera	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alnus napalensis	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Bridelia retusa	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Callicarpa arborea	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Castanopsis hystrix	11.806	5.032	1.154	1.033	2.391	0.000	0.385	0.000	0.000	0.000	0.000	21.801
Castanopsis indica	0.385	0.385	0.000	0.000	0.385	0.385	0.000	0.000	0.000	0.000	0.000	1.540
Diptocarpus turbinatus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ficus species	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Gmelina arborea	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Grewia tiliaefolia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Kydia calycina	1.795	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.795
Lagerstroemia flosreginae	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Macaranga denticulata	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Michelia champaca	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pinus khasya/insularis	20.005	36.027	34.046	22.095	13.988	8.152	7.564	0.950	0.317	0.317	0.000	143.461
Quercus serrata	2.596	1.298	0.000	0.649	0.649	0.649	0.649	0.000	0.000	0.000	0.000	6.490
Quercus species	14.674	7.550	2.537	1.92[illegible]	1.735	0.634	1.153	0.000	0.000	0.000	0.000	29.736
Schima wallichi	1.153	0.385	0.000	0.385	0.385	0.000	0.000	0.000	0.000	0.000	0.000	2.308
...f species	37.622	13.777	7.284	4.419	3.461	1.470	1.470	0.000	0.000	0.000	0.000	69.503
...ecies total	90.036	64.454	45.471	29.984	22.594	11.290	11.221	0.950	0.317	0.317	0.000	276.634

Table No. 6.0.20.T(A)

CROP COMPOSITION - LOWLAND HARDWOOD . STEMS(000) ENTIRE STATE AREA - 8348.28 Km2

Species Name	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	1322.580	662.734	285.693	186.840	146.746	52.019	65.109	21.617	0.000	0.000	0.000	2743.338
Albizzia procera	488.915	177.016	100.829	108.095	17.107	8.101	33.353	0.000	0.000	0.000	0.000	933.416
Alnus napalensis	883.315	414.702	114.617	86.194	99.710	40.604	87.529	7.676	8.101	13.516	21.192	1777.156
Bridalia retusa	253.024	69.402	60.384	30.651	0.000	13.516	22.477	11.239	24.755	0.000	0.000	485.440
Callicarpa arborea	961.085	269.626	102.554	16.274	0.000	5.619	16.274	0.000	0.000	0.000	0.000	1371.432
Castanopsis hystrix	6864.653	2767.457	1386.198	718.315	495.151	305.201	304.547	34.711	24.755	0.000	0.000	12900.988
Castanopsis indica	3600.096	1166.512	445.310	138.866	158.203	51.815	51.566	0.000	0.000	11.736	8.101	5632.205
Dipterocarpus turbinatus	395.079	246.144	171.261	127.122	162.331	150.595	212.911	63.146	51.410	35.209	35.209	1650.417
Ficus species	1899.806	490.715	340.053	115.684	55.333	35.993	89.414	24.755	19.340	11.239	47.232	3129.564
Gmelina arborea	528.903	390.041	247.514	116.080	89.459	64.587	83.342	0.000	19.340	0.000	22.477	1561.743
Grewia tiliaefolia	1234.575	344.529	142.877	97.571	5.868	11.736	0.000	0.000	0.000	0.000	0.000	1837.156
Kydia calycina	1104.133	518.519	270.590	109.092	76.568	15.352	19.135	0.000	0.000	0.000	0.000	2113.389
Lagerstroemia flosreginae	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Macaranga denticulata	87.188	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	87.188
Michelia champaca	288.852	98.726	17.604	24.755	13.516	13.516	0.000	0.000	0.000	0.000	0.000	456.969
Pinus khasya/insularis	231.004	124.020	152.843	182.709	164.803	102.074	146.942	17.107	0.000	16.201	19.340	1157.043
Quercus serrata	1044.944	544.846	307.041	138.662	141.348	97.782	126.625	8.101	56.826	0.000	23.472	2489.647
Quercus species	14474.730	6394.969	3208.319	1630.996	1393.822	869.304	649.486	128.109	54.063	0.000	13.516	28817.314
Schima wallichi	4275.053	2119.609	1089.261	502.442	402.508	285.505	306.264	159.400	24.755	40.547	56.122	9261.466
Rest of species	58680.029	26612.503	10856.931	4967.751	4486.467	2952.945	2615.493	872.061	634.655	400.454	468.910	113548.197
All species total	98617.964	43412.070	19299.879	9298.099	7908.938	5076.264	4830.467	1347.922	918.000	528.902	715.571	19195[illegible].076

Table No. 6.0.20.T(B)

CROP COMPOSITION - LOWLAND HARDWOOD STEMS/HA. ENTIRE STATE AREA - 8340.23 Km2

Species Name	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	1.584	0.794	0.342	0.224	0.176	0.062	0.078	0.026	0.000	0.000	0.000	3.286
Albizzia procera	0.586	0.212	0.121	0.129	0.020	0.010	0.040	0.000	0.000	0.000	0.000	1.118
Alnus nepalensis	1.058	0.497	0.137	0.103	0.119	0.049	0.105	0.009	0.010	0.016	0.025	2.128
Bridelia retusa	0.303	0.083	0.072	0.037	0.000	0.016	0.027	0.013	0.030	0.000	0.000	0.581
Callicarpa arborea	1.151	0.323	0.123	0.019	0.000	0.007	0.019	0.000	0.000	0.000	0.000	1.642
Castanopsis hystrix	8.223	3.315	1.660	0.860	0.593	0.366	0.365	0.042	0.030	0.000	0.000	15.454
Castanopsis indica	4.312	1.397	0.533	0.166	0.190	0.062	0.062	0.000	0.000	0.014	0.010	6.746
Dipterocarpus turbinatus	0.473	0.295	0.205	0.152	0.194	0.180	0.255	0.076	0.062	0.042	0.042	1.976
Ficus species	2.276	0.588	0.407	0.139	0.066	0.043	0.107	0.030	0.023	0.013	0.057	3.749
Gmelina arborea	0.634	0.467	0.296	0.139	0.107	0.077	0.099	0.000	0.023	0.000	0.027	1.869
Grewia tiliaefolia	1.479	0.413	0.171	0.117	0.007	0.014	0.000	0.000	0.000	0.000	0.000	2.201
Kydia calycina	1.323	0.621	0.324	0.131	0.092	0.018	0.023	0.000	0.000	0.000	0.000	2.532
Lagerstroemia flosreginae	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Macaranga denticulata	0.104	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.104
Michelia champaca	0.346	0.118	0.021	0.030	0.016	0.016	0.000	0.000	0.000	0.000	0.000	0.547
Pinus khasya/insularis	0.277	0.149	0.183	0.219	0.197	0.122	0.176	0.020	0.000	0.019	0.023	1.385
Quercus semiserra	1.252	0.653	0.368	0.166	0.169	0.117	0.152	0.010	0.063	0.000	0.028	2.983
Quercus species	17.339	7.660	3.843	1.954	1.670	1.041	0.776	0.153	0.065	0.000	0.016	34.519
Schima wallichii	5.121	2.539	1.305	0.602	0.432	0.342	0.367	0.191	0.030	0.049	0.067	11.095
Rest of species	70.290	31.978	13.005	5.951	5.374	3.537	3.133	1.045	0.760	0.480	0.362	136.015
All species total	118.131	52.002	23.116	11.138	9.472	6.079	5.786	1.615	1.101	0.633	0.857	229.930

Contents

Table No. 6.0.21.T.(A)

CROP COMPOSITION - UPLAND HARDWOOD STEMS(000) ENTIRE STATE AREA - 1125.31 Km2

Species Name	Diameter classes in cm. 10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	48.502	32.546	0.000	12.872	0.000	0.000	0.000	0.000	0.000	0.000	0.000	93.920
Albizzia procera	7.820	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.820
Alnus nepalensis	532.580	260.977	53.198	74.881	24.093	39.732	31.278	37.243	15.639	7.820	7.820	1085.181
Bridelia retusa	8.136	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.136
Callicarpa arborea	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Castanopsis hystrix	770.672	339.952	151.964	45.019	23.459	0.000	32.229	0.000	0.000	0.000	0.000	1363.295
Castanopsis indica	144.554	40.682	32.546	0.000	7.820	0.000	8.136	0.000	0.000	0.000	0.000	233.738
Dipterocarpus turbinatus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ficus species	79.147	30.057	51.660	24.409	8.136	8.136	43.840	0.000	0.000	0.000	0.000	245.385
Gmelina arborea	0.000	8.136	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.136
Grewia tiliaefolia	29.380	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	29.380
Kydia calycina	45.696	21.920	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	67.616
Lagerstroemia flosreginae	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Macaranga denticulata	13.784	13.784	0.000	0.000	0.000	0.000	13.784	0.000	0.000	0.000	13.784	55.136
Michelia champaca	7.820	0.000	7.820	0.000	0.000	8.136	0.000	0.000	0.000	7.820	0.000	31.596
Pinus khasya/ insularis	217.465	151.423	159.559	87.916	119.194	128.915	97.003	0.000	0.000	0.000	0.000	961.475
Quercus serrata	154.592	97.637	48.818	32.546	16.273	16.273	24.409	0.000	0.000	8.136	0.000	398.684
Quercus species	1608.696	705.350	210.771	199.614	114.011	119.933	130.780	31.278	21.604	35.337	29.423	3214.897
Schima wallichi	319.267	155.291	87.953	48.259	70.768	30.963	29.145	26.656	0.000	0.000	0.000	768.302
Rest of species	9810.632	4457.388	2036.476	1110.778	911.688	535.480	693.944	171.318	173.454	103.864	175.941	20181.163
All species total	13799.943	6315.143	2840.765	1636.264	1295.442	887.560	112.548	266.495	210.697	163.027	226.968	28753.860

Table No. 6.0.21.T(B)

CROP COMPOSITION - UPLAND HARDWOOD STEMS/HA. ENTIRE STATE AREA -1125.31 Km2

Species Name	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.431	0.289	0.000	0.114	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.834
Albizzia procera	0.069	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.069
Alnus nepalensis	4.733	2.319	0.473	0.665	0.214	0.353	0.278	0.331	0.139	0.069	0.069	9.643
Bridelia retusa	0.072	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.072
Callicarpa arborea	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Castanopsis hystrix	6.849	3.021	1.380	0.400	0.208	0.000	0.286	0.000	0.000	0.000	0.000	12.114
Castanopsis indica	1.285	0.362	0.289	0.000	0.069	0.000	0.072	0.000	0.000	0.000	0.000	2.077
Dipterocarpus turbinatus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ficus species	0.703	0.267	0.459	0.217	0.072	0.072	0.390	0.000	0.000	0.000	0.000	2.180
Gmelina arborea	0.000	0.072	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.072
Grewia tiliaefolia	0.261	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.261
Kydia calycina	0.406	0.195	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.601
Lagerstroemia flosreginae	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Macaranga denticulata	0.122	0.122	0.000	0.000	0.000	0.000	0.122	0.000	0.000	0.000	0.122	0.488
Michalia champaca	0.069	0.000	0.069	0.000	0.000	0.072	0.000	0.000	0.000	0.069	0.000	0.279
Pinus khasya/insularis	1.932	1.346	1.418	0.781	1.059	1.146	0.862	0.000	0.000	0.000	0.000	8.544
Quercus serrata	1.374	0.868	0.434	0.289	0.145	0.145	0.217	0.000	0.000	0.072	0.000	3.544
Quercus species	14.296	6.263	1.873	1.774	1.013	1.066	1.233	0.278	0.192	0.314	0.261	28.568
Schima wallichi	2.837	1.380	0.782	0.429	0.629	0.275	0.259	0.25[illegible]	0.000	0.000	0.000	6.828
Rest of species	87.183	39.610	18.097	9.871	8.102	4.759	6.167	1.522	1.541	0.923	1.563	179.338
All species total	122.622	56.119	25.244	14.540	11.511	7.880	9.886	2.368	1.872	1.447	2.015	255.512

Table No. 6.0.22.T.(A)

CROP COMPOSITION - BAMBOO BRAKES STEMS(000) ENTIRE STATE AREA - 1591.93 Km2

Species Name	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	57.254	0.000	20.228	0.000	0.000	20.228	0.000	10.114	10.114	0.000	0.000	117.938
Albizzia procera	64.717	33.367	11.122	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	109.206
Alnus nepalensis	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Bridelia retusa	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Callicarpa arborea	233.062	28.972	9.429	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	271.463
Castanopsis hystrix	87.285	22.245	11.122	9.429	0.000	0.000	0.000	0.000	0.000	0.000	0.000	130.081
Castanopsis indica	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Dipterocarpus turbinatus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ficus species	62.294	14.828	0.000	9.429	0.000	0.000	9.429	0.000	0.000	0.000	0.000	95.980
Gmelina arborea	62.315	20.551	31.674	0.000	0.000	0.000	22.245	0.000	0.000	0.000	0.000	136.785
Grewia tiliaefolia	28.285	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	28.285
Hydia calycina	64.717	33.367	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	96.084
Lagerstroemia floaregina	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Macaranga denticulata	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Michelia champaca	0.000	0.000	0.000	0.000	4.371	0.000	0.000	0.000	0.000	0.000	0.000	4.371
Pinus khasya/insularis	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Quercus serrata	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Quercus species	95.706	105.817	13.800	26.616	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	241.939
Schima wallichi	173.495	67.718	29.978	23.914	9.429	4.371	0.000	4.371	0.000	0.000	0.000	313.276
Rest of species	1989.351	664.887	292.396	235.142	205.825	69.750	165.431	58.952	9.085	18.858	28.287	3737.964
All species total	2918.481	491.752	419.749	304.530	219.625	94.349	197.105	73.437	19.199	18.850	28.287	5285.372

Table 6.0.22.T(B)

CROP COMPOSITION - BAMBOO BRAKES STEMS/HA. ENTIRE STATE AREA - 1591.93 Km2

Species Name	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.360	0.000	0.127	0.000	0.000	0.127	0.000	0.064	0.064	0.000	0.000	0.742
Albizzia procera	0.407	0.210	0.070	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.687
Alnus nepalensis	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Bridelia retusa	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Callicarpa arborea	1.464	0.182	0.059	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.707
Castanopsis hystrix	0.548	0.140	0.070	0.059	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.817
Castanopsis indica	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Dipterocarpus turbinatus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ficus species	0.391	0.093	0.000	0.059	0.000	0.000	0.059	0.000	0.000	0.000	0.000	0.602
Gmelina arborea	0.391	0.129	0.199	0.000	0.000	0.000	0.140	0.000	0.000	0.000	0.000	0.859
Grewia tiliaefolia	0.178	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.178
Kydia calycina	0.407	0.210	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.617
Lagerstroemia flosreginae	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Macaranga denticulata	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Michelia champaca	0.000	0.000	0.000	0.000	0.028	0.000	0.000	0.000	0.000	0.000	0.000	0.028
Pinus khasya/insularis	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Quercus serrata	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Quercus species	0.601	0.565	0.087	0.167	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.520
Schima wallichii	1.090	0.425	0.188	0.150	0.059	0.028	0.000	0.028	0.000	0.000	0.000	1.968
Rest of species	12.497	4.177	1.837	1.477	1.293	0.438	1.039	0.370	0.057	0.119	0.178	23.482
All species total	18.334	6.231	2.637	1.912	1.3[illegible]0	0.593	1.230	0.462	0.121	0.119	0.178	33.207

Contents

Table No. 6.0.23.T(A)

CROP COMPOSITION - ALL COMBINED STEM(000) ENTIRE STATE AREA - 11263.90 Km2

Species Name	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	1428.336	695.280	305.921	199.712	146.746	72.247	65.109	31.731	10.114	0.000	0.000	2955.196
Albizzia procera	561.452	210.383	111.951	108.095	17.107	8.101	33.353	0.000	0.000	0.000	0.000	1050.442
Alnus nepalensis	1415.895	675.679	167.815	160.995	123.803	80.336	118.807	44.919	23.740	21.336	29.012	2862.337
Bridelia retusa	261.160	69.402	60.304	30.651	0.000	13.516	22.477	11.239	24.755	0.000	0.000	493.584
Callicarpa arborea	1194.147	298.598	111.983	16.274	0.000	5.619	16.274	0.000	0.000	0.000	0.000	1642.896
Castanopsis hystrix	7956.818	3229.475	1572.168	793.264	566.049	305.201	344.404	34.711	24.755	0.000	0.000	14826.845
Castanopsis indica	3752.278	1214.822	477.856	138.866	173.651	59.443	59.702	0.000	0.000	11.736	8.101	5896.456
Dipterocarpus turbinatus	395.079	246.144	171.261	127.122	162.331	150.895	212.911	63.146	51.410	35.209	35.209	1650.417
Ficus species	2041.247	535.600	391.713	149.522	63.469	44.129	142.683	24.755	19.340	11.239	47.232	3470.929
Gmelina arborea	591.218	418.728	279.188	116.080	89.459	64.587	105.587	0.000	19.340	0.000	22.477	1706.664
Grewia tiliaefolia	1292.240	344.529	142.877	97.571	5.868	11.736	0.000	0.000	0.000	0.000	0.000	1894.821
Kydia calycina	1250.152	573.806	270.590	109.092	76.568	15.352	19.135	0.000	0.000	0.000	0.000	2314.695
Lagerstroemia flosreginae	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Macaranga denticulata	100.972	13.784	0.000	0.000	0.000	0.000	13.784	0.000	0.000	0.000	13.784	142.324
Michelia champaca	296.672	98.726	25.424	24.755	17.887	21.652	0.000	0.000	0.000	7.820	0.000	492.936
Pinus khasya/ insularis	845.335	990.155	987.806	708.948	561.496	392.699	393.998	35.962	6.265	22.486	19.340	4964.510
Quercus serrata	1251.029	668.230	355.859	184.081	170.494	126.928	163.907	0.101	56.826	8.136	23.472	3017.063
Quercus species	16470.241	7355.909	3492.141	1885.102	1534.316	1001.607	811.150	159.387	75.667	85.387	42.939	32664.046
Schima wallichi	4790.699	2350.246	1207.192	582.243	490.333	320.839	335.409	190.427	24.755	40.547	56.122	10388.812
Rest of species	71226.547	32008.096	13330.307	6401.331	5672.631	3587.344	3504.037	1102.331	817.194	523.176	673.133	138846.132
All species total	117121 517	51997.592	23462.436	11633.704	9872.208	6282.131	6362.727	1706.709	1154.181	717.072	970.826	231481.103

Contents

Table No. 6.0.23.T(B)

CROP COMPOSITION - ALL COMBINED STEMS/HA. ENTIRE STATE AREA - 11263.90 Km2

Species Name	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	1.263	0.617	0.272	0.177	0.130	0.064	0.058	0.028	0.009	0.000	0.000	2.623
Albizzia procera	0.498	0.187	0.099	0.096	0.015	0.007	0.030	0.000	0.000	0.000	0.000	0.932
Alnus nepalensis	1.257	0.600	0.149	0.143	0.110	0.071	0.105	0.040	0.021	0.019	0.026	2.541
Bridelia retusa	0.232	0.062	0.054	0.027	0.000	0.012	0.020	0.010	0.022	0.000	0.000	0.439
Callicarpa arborea	1.060	0.265	0.099	0.014	0.000	0.005	0.014	0.000	0.000	0.000	0.000	1.457
Castanopsis hystrix	7.064	2.967	1.396	0.704	0.503	0.271	0.306	0.031	0.022	0.000	0.000	13.164
Castanopsis indica	3.331	1.079	0.424	0.123	0.154	0.053	0.053	0.000	0.000	0.010	0.007	5.234
Dipterocarpus turbinatus	0.351	0.219	0.152	0.113	0.144	0.134	0.189	0.056	0.046	0.031	0.031	1.466
Ficus species	1.812	0.476	0.348	0.133	0.056	0.039	0.127	0.022	0.017	0.010	0.042	3.082
Gmelina arborea	0.525	0.372	0.248	0.103	0.079	0.057	0.094	0.000	0.017	0.000	0.020	1.515
Grewia tiliaefolia	1.147	0.306	0.127	0.087	0.005	0.010	0.000	0.000	0.000	0.000	0.000	1.682
Kydia calycina	1.110	0.509	0.240	0.097	0.068	0.014	0.017	0.000	0.000	0.000	0.000	2.055
Lagerstroemia flosreginae	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Macaranga denticulata	0.090	0.012	0.000	0.000	0.000	0.000	0.012	0.000	0.000	0.000	0.012	0.126
Michelia champaca	0.263	0.088	0.023	0.022	0.016	0.019	0.000	0.000	0.000	0.007	0.000	0.438
Pinus khasya/insularis	0.750	0.879	0.877	0.629	0.498	0.349	0.350	0.032	0.006	0.020	0.017	4.407
Quercus serrata	1.111	0.593	0.316	0.163	0.151	0.113	0.146	0.007	0.050	0.007	0.021	2.678
Quercus species	14.622	6.531	3.100	1.674	1.362	0.889	0.720	0.142	0.067	0.031	0.038	29.176
Schima wallichii	4.253	2.086	1.077	0.517	0.435	0.285	0.298	0.169	0.022	0.036	0.050	9.223
Rest of species	63.234	28.417	11.835	[illegible]	5.036	3.105	3.111	0.979	0.725	0.464	0.598	123.267
All species total	103.979	46.165	20.831	10.505	8.762	5.577	5.650	1.516	1.024	0.635	0.062	205.505

Table No. 6.0.24.T(A)

CROP COMPOSITION - LOWLAND HARDWOOD VOL.(000) cu.m. DISTTS: IMPHAL, THOUBAL & BISHNUPUR AREA - 125.88 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia procera	0.000	0.000	0.000	2.156	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.156
Calicarpa arborea	0.881	2.647	1.014	1.786	0.000	0.000	4.809	0.000	0.000	0.000	0.000	11.139
Fiscus species	0.569	0.459	1.297	0.000	0.000	0.000	6.034	0.000	0.000	0.000	0.000	8.360
Gmelina arborea	0.205	2.367	1.151	0.000	2.560	0.000	5.715	0.000	0.000	0.000	0.000	11.999
Grewia tiliaefolia	0.160	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.160
Macaranga denticulata	0.121	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.121
Quercus species	0.843	1.012	0.000	1.967	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.822
Schima wallichi	0.954	3.916	5.218	1.615	0.000	3.723	4.809	0.000	0.000	0.000	0.000	20.265
Rest of species	17.426	36.335	38.751	41.589	37.644	41.220	27.489	36.436	13.751	20.239	0.000	310.879
All species total	21.188	46.738	47.432	49.113	40.204	44.943	48.858	36.436	13.751	20.239	0.000	368.900

Table No. 6.0.24.T(B)

CROP COMPOSITION - LOWLAND HARDWOOD VOL./HA. cu.m. DISTTS: IMPHAL, THOUBAL & BISHNUPUR AREA - 125.88 km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia procera	0.000	0.000	0.000	0.171	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.171
Calicarpa arborea	0.070	0.210	0.031	0.142	0.000	0.000	0.382	0.000	0.000	0.000	0.000	0.885
Fiscus species	0.045	0.036	0.103	0.000	0.000	0.000	0.479	0.000	0.000	0.000	0.000	0.664
Gmelina arborea	0.016	0.188	0.091	0.000	0.203	0.000	0.454	0.000	0.000	0.000	0.000	0.953
Grewia tiliaefolia	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013
Macaranga denticulata	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010
Quercus species	0.067	0.030	0.000	0.156	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.304
Schima wallichi	0.078	0.311	0.415	0.128	0.000	0.296	0.382	0.000	0.000	0.000	0.000	1.610
Rest of species	1.384	2.887	3.078	3.304	2.990	3.275	2.184	2.894	1.092	1.608	0.000	24.696
All species total	1.683	3.713	3.768	3.902	3.194	3.570	3.881	2.894	1.092	1.608	0.000	29.306

Contents

Table No. 6.0.25.T(A)

CROP COMPOSITION - BAMBOO BRAKES VOL.(000) cu.m. DISTTS: IMPHAL, THOUBAL & BISHNUPUR AREA - 157.36 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.128	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.128
Ficus species	0.218	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.218
Gmelina arborea	0.041	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.041
Grewia tiliaefolia	0.190	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.190
Michelia champaca	0.000	0.000	0.000	0.000	2.806	0.000	0.000	0.000	0.000	0.000	0.000	2.806
Quercus species	0.000	0.798	0.881	1.402	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.080
Schima wallichi	0.105	0.239	2.029	1.402	0.000	3.232	0.000	8.785	0.000	0.000	0.000	15.012
Rest of species	1.962	7.367	3.006	4.660	5.207	0.000	4.430	0.000	11.937	0.000	0.000	38.569
All species total	2.645	8.423	5.916	7.463	8.013	3.232	4.430	8.785	11.937	0.000	0.000	60.844

Table No. 6.0.25.T(B)

CROP COMPOSITION - BAMBOO BRAKES VOL./HA. cu.m. DISTTS: IMPHAL, THOUBAL & BISHNUPUR AREA - 157.36 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
Ficus species	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014
Gmelina arborea	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003
Grewia tiliaefolia	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012
Michelia champaca	0.000	0.000	0.000	0.000	0.178	0.000	0.000	0.000	0.000	0.000	0.000	0.178
Quercus species	0.000	0.051	0.056	0.089	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.196
Schima wallichi	0.007	0.016	0.129	0.089	0.000	0.205	0.000	0.558	0.000	0.000	0.000	1.005
Rest of species	0.125	0.468	0.191	0.296	0.331	0.000	0.281	0.000	0.759	0.000	0.000	2.451
All species total	0.168	0.535	0.376	0.474	0.509	0.205	0.281	0.558	0.759	0.000	0.000	3.867

Contents

Table No: 6.0.26.T(A)

CROP COMPOSITION - CONIFERS VOL.(000)CU.M. DISTT: SENAPATI AREA - 37.72 Km2

Species description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Castanopsis hystrix	0.390	1.913	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.303
Kydia calycina	0.028	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.028
Pinus khasya/insularis	4.021	11.970	31.834	33.050	9.960	5.228	31.441	43.449	16.384	22.167	0.000	209.006
Quercus species	0.862	5.536	10.137	4.921	9.878	9.305	0.000	0.000	0.000	0.000	0.000	40.637
Rest of species	2.217	4.228	9.020	5.146	0.000	4.970	6.746	0.000	0.000	0.000	0.000	32.328
All species total	7.519	23.647	50.491	43.118	19.838	19.503	38.187	43.449	16.384	22.167	0.000	284.303

Table No: 6.0.26.T(B)

CROP COMPOSITION - CONIFERS VOL./HA. CU.M. DISTT: SENAPATI AREA - 37.72 Km2

Species description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Castanopsis hystrix	0.103	0.507	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.611
Kydia calycina	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
Pinus khasya/insularis	1.066	3.174	8.309	8.764	2.641	1.386	8.338	11.522	4.345	5.878	0.000	55.425
Quercus species	0.229	1.468	2.688	1.305	2.619	2.467	0.000	0.000	0.000	0.000	0.000	10.776
Rest of species	0.588	1.121	2.392	1.365	0.000	1.318	1.789	0.000	0.000	0.000	0.000	8.573
All species total	1.994	6.271	13.389	11.434	5.261	5.172	10.126	11.522	4.345	5.878	0.000	75.392

Contents

Table No: 6.0.27.T(A)

CROP COMPOSITION - LOWLAND HARDWOOD VOL.(000) CU.M. DISTT: SENAPATI AREA - 729.20 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	3.012	9.240	4.875	0.000	0.000	6.069	16.491	0.000	0.000	0.000	0.000	39.686
Albizzia procera	0.450	0.455	0.000	3.287	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.191
Alnus nepalensis	7.037	13.637	11.042	2.723	3.903	10,970	41.455	12.977	0.000	0.000	74.743	178.488
Bridelia retusa	0.106	1.454	0.000	3.287	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.846
Callicarpa arborea	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.035
Castanopsis hystrix	16.096	24.977	23.929	30.022	30.024	54.880	18.925	0.000	0.000	0.000	0.000	178.853
Castanopsis indica	1.106	2.413	6.225	0.000	17.318	6.069	7.778	0.000	0.000	0.000	0.000	40.910
Ficus species	5.354	6.203	4.457	5.748	0.000	0.000	0.000	0.000	0.000	0.000	0.000	21.761
Grewia tiliaefolia	1.235	4.892	2.213	9.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000	17.374
Kydia calycina	3.711	6.332	3.106	2.723	3.903	11.745	0.000	0.000	0.000	0.000	0.000	31.520
Michalia champaca	0.262	0.455	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.716
Pinus khasya/insularis	0.337	3.482	11.246	12.374	5.215	0.000	10.607	0.000	0.000	0.000	0.000	43.260
Quercus species	31.656	62.749	61.552	71.267	60.645	43.354	15.570	0.000	0.000	0.000	0.000	346.793
Schima wallichi	4.590	5.894	4.082	5.460	3.903	6.898	0.000	0.000	0.000	0.000	0.000	30.796
Rest of species	71.039	142.221	136.638	136.249	81.499	73.453	142.347	30.973	108.727	57.300	111.644	1092.085
All species total	146.024	284.401	269.335	282.175	206.410	193.438	253.173	43.950	108.727	57.300	186.386	2031.317

Table No: 6.0.27.T(B)

CROP COMPOSITION - LOWLAND HARDWOOD VOL./HA. CU.M. DISTT: SENAPATI AREA - 729.20 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.041	0.127	0.067	0.000	0.000	0.083	0.226	0.000	0.000	0.000	0.000	0.544
Albizzia procera	0.006	0.006	0.000	0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.057
Alnus nepalensis	0.097	0.187	0.151	0.037	0.054	0.150	0.569	0.178	0.000	0.000	1.025	2.448
Bridelia retusa	0.001	0.020	0.000	0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.066
Callicarpa arborea	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Castanopsis hystrix	0.221	0.343	0.328	0.412	0.412	0.478	0.260	0.000	0.000	0.000	0.000	2.453
Castanopsis indica	0.015	0.033	0.085	0.000	0.237	0.083	0.107	0.000	0.000	0.000	0.000	0.561
Ficus species	0.073	0.065	0.061	0.079	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.298
Grewia tiliaefolia	0.017	0.067	0.030	0.124	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.238
Kydia calycina	0.051	0.087	0.043	0.037	0.054	0.161	0.000	0.000	0.000	0.000	0.000	0.432
Michalia champaca	0.004	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010
Pinus khasya/insularis	0.005	0.048	0.154	0.170	0.072	0.000	0.145	0.000	0.000	0.000	0.000	0.593
Quercus species	0.434	0.861	0.844	0.977	0.832	0.595	0.214	0.000	0.000	0.000	0.000	4.756
Schima wallichi	0.063	0.081	0.056	0.075	0.054	0.095	0.000	0.000	0.000	0.000	0.000	0.422
Rest of species	0.974	1.950	1.874	1.868	1.118	1.007	1.952	0.425	1.491	0.786	1.531	14.977
All species total	2.003	3.900	3.694	3.870	2.831	2.653	3.472	0.603	1.491	0.786	2.556	27.857

Contents

Table No: 6.0.28.T(A)

CROP COMPOSITION - UPLAND HARDWOOD VOL.(000) CU.M. DISTT: SENAPATI AREA -320.60 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.267	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.267
Albizzia procera	0.267	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.267
Alnus nepalensis	6.693	11.251	7.220	13.646	4.310	18.563	38.558	44.035	49.049	30.516	37.196	261.036
Castanopsis hystrix	3.596	11.779	7.899	6.123	12.985	0.000	9.371	0.000	0.000	0.000	0.000	51.752
Castanopsis indica	0.838	0.000	0.000	0.000	4.658	0.000	0.000	0.000	0.000	0.000	0.000	5.496
Ficus species	0.390	0.000	1.788	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.179
Kydia calycina	0.377	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.377
Michelia champaca	0.189	0.000	2.014	0.000	0.000	0.000	0.000	0.000	0.000	27.856	0.000	30.059
Pinus khasya/insularis	1.900	9.597	19.624	15.605	39.967	23.992	17.520	0.000	0.000	0.000	0.000	128.205
Quercus species	7.634	7.178	5.405	8.630	26.303	17.814	16.344	59.349	24.497	30.516	90.174	293.845
Schima wallichi	0.987	1.440	3.603	2.774	8.634	0.000	0.000	0.000	0.000	0.000	0.000	17.638
Rest of species	66.001	106.946	91.524	119.299	171.162	194.558	309.741	102.996	128.451	185.061	655.341	2131.080
All species total	89.135	148.191	139.278	166.077	268.019	254.926	391.534	206.380	201.998	273.950	782.711	2922.200

Table No: 6.0.28.T(B)

CROP COMPOSITION - UPLAND HARDWOOD VOL./HA. DISTT: SENAPATI AREA - 320.60 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
Albizzia procera	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
Alnus nepalensis	0.209	0.351	0.225	0.426	0.134	0.579	1.203	1.374	1.530	0.952	1.160	8.142
Castanopsis hystrix	0.112	0.367	0.246	0.191	0.405	0.000	0.292	0.000	0.000	0.000	0.000	1.614
Castanopsis indica	0.026	0.000	0.000	0.000	0.145	0.000	0.000	0.000	0.000	0.000	0.000	0.171
Ficus species	0.012	0.000	0.056	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.068
Kydia calycina	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012
Michelia champaca	0.006	0.000	0.063	0.000	0.000	0.000	0.000	0.000	0.000	0.869	0.000	0.938
Pinus khasya/insularis	0.059	0.299	0.612	0.487	1.247	0.748	0.546	0.000	0.000	0.000	0.000	3.999
Quercus species	0.238	0.224	0.169	0.269	0.820	0.556	0.510	1.851	0.764	0.952	2.813	9.165
Schima wallichi	0.031	0.045	0.119	0.087	0.269	0.000	0.000	0.000	0.000	0.000	0.000	0.550
Rest of species	2.059	3.336	2.855	3.721	5.339	6.069	9.661	3.213	4.007	5.772	20.441	66.472
All species total	2.780	4.622	4.344	5.180	8.360	7.952	12.213	6.437	6.301	8.545	24.414	91.148

Contents

Table No: 6.0.29.T(A)

CROP COMPOSITION - LOWLAND HARDWOOD VOL (000)CU.M. DISTT: CHURACHANDPUR AREA - 2022.98 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	11.086	24.945	24.677	20.340	34.596	13.330	22.140	0.000	0.000	0.000	0.000	151.114
Albizzia procera	4.220	9.709	9.756	7.591	6.694	0.000	0.000	0.000	0.000	0.000	0.000	37.970
Alnus nepalensis	0.192	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.192
Bridelia retusa	0.799	2.488	0.000	4.812	0.000	0.000	29.905	25.482	37.584	0.000	0.000	101.070
Callicarpa arborea	10.602	19.094	11.920	3.796	0.000	5.050	12.756	0.000	0.000	0.000	0.000	63.218
Castanopsis hystrix	17.308	55.932	108.692	103.580	51.087	52.859	103.727	20.755	27.508	0.000	0.000	541.947
Castanopsis indica	0.918	1.273	1.448	2.195	0.000	0.000	8.257	0.000	0.000	0.000	0.000	14.090
Ficus species	15.440	13.936	32.947	20.359	19.162	17.235	61.401	18.152	29.611	42.566	200.087	470.894
Gmelina arborea	4.188	17.953	38.869	25.957	22.970	30.873	51.083	0.000	37.584	0.000	271.630	501.107
Grewia tiliaefolia	14.660	14.874	21.675	14.206	0.000	0.000	0.000	0.000	0.000	0.000	0.000	65.415
Kydia calycina	7.292	18.920	13.519	4.390	12.409	0.000	5.367	0.000	0.000	0.000	0.000	61.898
Michelia champaca	0.000	0.000	0.000	3.987	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.987
Pinus khasya/insularis	0.439	0.000	3.535	2.156	12.694	13.138	25.181	24.227	0.000	0.000	55.853	137.222
Quercus serrata	0.000	0.000	0.000	0.000	0.000	0.000	14.201	0.000	0.000	0.000	0.000	14.201
Quercus species	58.437	135.741	183.774	119.569	212.650	171.515	177.425	88.811	0.000	0.000	0.000	1147.921
Schima wallichi	40.246	93.855	83.530	82.827	76.943	86.136	126.377	84.374	30.692	0.000	48.714	753.692
Rest of species	291.542	602.733	608.608	357.505	617.033	456.052	858.328	369.607	258.441	540.727	1158.898	6119.668
All species total	477.868	1011.454	1143.149	773.270	1066.238	846.188	1496.147	631.408	421.419	583.293	1735.182	10185.605

Contents

Table No: 6.0.29.T(B)

CROP COMPOSITION - LOWLAND HARDWOOD VOL./HA.CU.M. DISTT: CHURACHANDPUR AREA - 2022.95 Km2

Species description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.055	0.123	0.122	0.101	0.171	0.066	0.109	0.000	0.000	0.000	0.000	0.747
Albizzia procera	0.021	0.048	0.048	0.038	0.033	0.000	0.000	0.000	0.000	0.000	0.000	0.188
Alnus nepalensis	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
Bridelia retusa	0.004	0.012	0.000	0.024	0.000	0.000	0.148	0.126	0.186	0.000	0.000	0.500
Callicarpa arborea	0.052	0.094	0.059	0.019	0.000	0.025	0.063	0.000	0.000	0.000	0.000	0.313
Castanopsis hystrix	0.088	0.276	0.537	0.512	0.253	0.261	0.513	0.103	0.136	0.000	0.000	2.679
Castanopsis indica	0.005	0.006	0.007	0.011	0.000	0.000	0.041	0.000	0.000	0.000	0.000	0.070
Ficus species	0.076	0.069	0.163	0.101	0.095	0.085	0.304	0.090	0.146	0.210	0.989	2.328
Gmelina arborea	0.021	0.089	0.192	0.128	0.114	0.153	0.253	0.000	0.186	0.000	1.343	2.477
Grewia tiliaefolia	0.072	0.074	0.107	0.070	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.323
Kydia calycina	0.036	0.094	0.067	0.022	0.061	0.000	0.027	0.000	0.000	0.000	0.000	0.306
Michelia champaca	0.000	0.000	0.000	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020
Pinus khasya/insularis	0.002	0.000	0.017	0.011	0.063	0.065	0.124	0.120	0.000	0.000	0.276	0.678
Quercus serrata	0.000	0.000	0.000	0.000	0.000	0.000	0.070	0.000	0.000	0.000	0.000	0.070
Quercus species	0.289	0.671	0.908	0.591	1.051	0.848	0.877	0.439	0.000	0.000	0.000	5.674
Schima wallichi	0.199	0.464	0.413	0.409	0.380	0.426	0.625	0.417	0.152	0.000	0.241	3.726
Rest of species	1.441	2.979	3.010	1.767	5.050	2.254	4.243	1.827	1.278	2.673	5.729	30.251
All species total	2.362	5.000	5.651	3.822	5.271	4.183	7.396	3.121	2.083	2.883	8.577	50.350

Contents

Table No: 6.0.30.T(A)

CROP COMPOSITION - UPLAND HARDWOOD VOL.(000)CU.M. DISTT: CHURACHANDPUR AREA - 58.76 Km2

Species description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Castanopsis hystrix	7.466	12.589	19.483	9.422	0.000	0.000	0.000	0.000	0.000	0.000	0.000	48.961
Ficus species	0.233	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.233
Grewia tiliaefolia	0.203	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.203
Quercus species	3.379	2.832	5.944	0.000	0.000	21.748	0.000	0.000	0.000	0.000	0.000	33.904
Schima wallichi	0.557	1.613	4.235	0.000	7.470	10.861	0.000	0.000	0.000	0.000	0.000	24.737
Rest of species	16.232	34.272	29.662	28.241	26.276	47.344	35.236	0.000	41.556	109.661	0.000	368.430
All species total	28.072	51.307	59.325	37.663	33.746	79.954	35.236	0.000	41.556	109.661	0.000	476.518

Table No: 6.0.30.T(B)

CROP COMPOSITION - UPLAND HARDWOOD VOL./HA. CU.M. DISTT: CHURACHANDPUR AREA - 58.76 Km2

Species description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Castanopsis hystrix	1.271	2.143	3.316	1.603	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.332
Ficus species	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.040
Grewia tiliaefolia	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.035
Quercus species	0.575	0.482	1.012	0.000	0.000	3.701	0.000	0.000	0.000	0.000	0.000	5.770
Schima wallichi	0.095	0.275	0.721	0.000	1.271	1.848	0.000	0.000	0.000	0.000	0.000	4.210
Rest of species	2,762	5.833	5.048	4.806	4.472	8.057	5.997	0.000	7.072	18.662	0.000	62.709
All species total	4.777	3.732	10.096	6.410	5.743	13.607	5.997	0.000	7.072	18.662	0.000	81.096

Contents

Table No: 6.0.31.T(A)

CROP COMPOSITION - BAMBOO BRAKES VOL.(000)CU.M. DISTT: CHURACHANDPUR AREA - 688.31 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.149	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.149
Callicarpa arborea	3.726	1.419	2.429	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.573
Castanopsis hystrix	0.043	0.000	0.000	3.683	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.726
Ficus species	0.616	0.279	0.000	3.024	0.000	0.000	13.855	0.000	0.000	0.000	0.000	17.774
Gmelina arborea	0.692	0.701	2.156	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.549
Grewia tiliaefolia	0.043	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.043
Quercus species	0.471	0.000	2.718	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.189
Schima wallichi	1.392	1.561	0.000	3.024	4.794	0.000	0.000	0.000	0.000	0.000	0.000	10.772
Rest of species	18.777	28.872	34.682	39.196	66.199	21.883	84.405	68.909	13.336	71.440	153.585	601.273
All species total	25.908	32.832	41.986	48.926	70.934	21.883	98.259	68.909	13.336	71.440	153.585	648.048

Table No: 6.0.31.T(B)

CROP COMPOSITION - BAMBOO BRAKES VOL./HA. CU.M. DISTT: CHURACHANDPUR AREA - 688.31 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
Callicarpa arborea	0.054	0.021	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.110
Castanopsis hystrix	0.001	0.000	0.000	0.054	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.054
Ficus species	0.009	0.004	0.000	0.044	0.000	0.000	0.201	0.000	0.000	0.000	0.000	0.258
Gmelina arborea	0.010	0.010	0.031	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.052
Grewia tiliaefolia	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
Quercus species	0.007	0.000	0.039	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.046
Schima wallichi	0.020	0.023	0.000	0.044	0.070	0.000	0.000	0.000	0.000	0.000	0.000	0.156
Rest of species	0.273	0.419	0.504	0.569	0.962	0.318	1.226	1.001	0.194	1.038	2.231	8.736
All species total	0.376	0.477	0.610	0.711	1.031	0.318	1.420	1.001	0.194	1.038	2.231	9.415

Table No: 6.0.32.T(R)

CROP COMPOSITION - CONIFERS VOL.(000)CU.M. DISTT: UKHRUL AREA - 122.05 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	69-70	70-80	80+	Total
Castanopsis hystrix	1.036	2.837	6.143	2.446	7.445	0.000	8.653	0.000	0.000	0.000	0.000	28.614
Castanopsis indica	0.184	0.567	0.000	0.000	4.205	6.032	0.000	0.000	0.000	0.000	0.000	10.988
Kydia calycina	0.326	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.326
Pinus khasya/insularis	9.761	72.740	132.797	123.702	116.047	107.710	122.563	0.000	0.000	0.000	0.000	685.320
Quercus species	4.276	6.293	3.087	5.426	4.596	0.000	28.917	0.000	0.000	0.000	0.000	52.895
Schima wallichi	0.376	0.452	0.000	2.446	3.566	0.000	0.000	0.000	0.000	0.000	0.000	6.840
Rest of species	10.790	16.619	24.969	27.443	36.631	18.513	25.622	0.000	0.000	0.000	0.000	160.588
All species total	26.739	99.508	166.995	161.463	172.790	132.256	185.760	0.000	0.000	0.000	0.000	945.569

Table No: 6.0.32.T(B)

CROP COMPOSITION - CONIFERS VOL/HA.CU.M. DISTT: UKHRUL AREA - 122.05 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	69-70	70-80	80+	Total
Castanopsis hystrix	0.089	0.232	0.503	0.200	0.610	0.000	0.709	0.000	0.000	0.000	0.000	2.344
Castanopsis indica	0.015	0.046	0.000	0.000	0.345	0.494	0.000	0.000	0.000	0.000	0.000	0.900
Kydia calycina	0.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027
Pinus khasya/insularis	0.800	5.960	10.881	10.135	9.508	8.825	10.042	0.000	0.000	0.000	0.000	56.151
Quercus species	0.350	0.516	0.253	0.445	0.401	0.000	2.369	0.000	0.000	0.000	0.000	4.334
Schima wallichi	0.031	0.037	0.000	0.200	0.292	0.000	0.000	0.000	0.000	0.000	0.000	0.560
Rest of species	0.884	1.362	2.046	2.249	3.001	1.517	2.099	0.000	0.000	0.000	0.000	13.158
All species total	2.196	[illegible]	13.682	13.229	14.157	10.836	15.220	0.000	0.000	0.000	0.000	77.474

Contents

Table No: 6.0.33.T(A)

CROP COMPOSITION LOWLAND HARDWOOD VOL.(000) CU.M. DISTT; UKHRUL AREA - 1539.14 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	69-70	70-80	80+	Total
Albizzia lebbek	2.923	10.010	6.758	10.406	0.000	7.279	0.000	17.658	0.000	0.000	0.000	55.034
Albizzia procera	2.165	5.191	7.231	27.678	0.000	5.990	7.737	0.000	0.000	0.000	0.000	55.992
Alnus nepalensis	5.154	15.268	2.087	2.598	4.825	0.000	10.236	0.000	24.544	0.000	0.000	64.712
Bridelia retusa	1.075	0.890	1.632	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.597
Callicarpa arborea	2.616	3.520	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.136
Castanopsis hystrix	18.784	26.365	21.834	9.811	4.625	12.395	24.641	0.000	0.000	0.000	0.000	118.676
Castanopsis indica	44.898	75.701	65.900	44.094	38.866	26.510	31.893	0.000	0.000	0.000	37.503	365.285
Dipterocarpus turbinatus	1.763	10.353	20.118	21.363	31.673	41.164	58.460	32.688	45.038	0.000	0.000	262.651
Ficus species	5.746	11.450	12.[illegible]	12.105	4.465	0.000	15.946	0.000	25.379	0.000	0.000	87.424
Gmelina arborea	1.516	8.476	2.335	3.469	4.465	0.000	11.333	0.000	25.379	0.000	0.000	56.973
Grewia tiliaefolia	3.251	2.273	3.751	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.285
Kydia calycina	5.045	10.038	18.449	5.195	0.000	0.000	0.000	0.000	0.000	0.000	0.000	38.727
Michelia champaca	0.257	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.257
Pinus khasya/insularis	2.014	3.596	13.381	42.242	61.583	24.018	46.504	0.000	0.000	58.040	40.259	291.636
Quercus serrata	16.569	40.447	53.223	42.353	70.531	44.464	63.461	14.321	22.123	0.000	0.000	368.540
Quercus species	53.421	84.269	85.013	67.458	39.232	43.646	60.934	0.000	0.000	0.000	0.000	434.003
Schima wallichii	7.330	13.201	8.657	2.374	14.144	0.000	17.917	13.896	0.000	0.000	0.000	77.518
Rest of species	230.589	427.575	364.648	283.369	367.482	361.325	391.862	294.461	240.290	216.218	347.207	3515.028
All species total	403.145	749.193	687.261	575.046	642.112	567.271	730.924	372.943	382.751	274.259	424.969	5811.773

Contents

Table No: 6.0.33.T(B)

CROP COMPOSITION - LOWLAND HARDWOOD VOL./HA. CU.M. DISTT; UKHRUL AREA - 1539.14 Km2

Species description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	69-70	70-80	80+	Total
Albizzia lebbek	0.019	0.065	0.044	0.068	0.000	0.047	0.000	0.115	0.000	0.000	0.000	0.358
Albizzia procera	0.014	0.034	0.047	0.180	0.000	0.039	0.050	0.000	0.000	0.000	0.000	0.364
Alnus napalensis	0.033	0.099	0.014	0.017	0.031	0.000	0.067	0.000	0.159	0.000	0.000	0.420
Bridelia retusa	0.007	0.006	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023
Callicarpa arborea	0.017	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.040
Castanopsis hystrix	0.122	0.171	0.142	0.064	0.031	0.081	0.160	0.000	0.000	0.000	0.000	0.771
Castanopsis indica	0.292	0.492	0.428	0.286	0.253	0.172	0.207	0.000	0.000	0.000	0.244	2.373
Dipterocarpus turbinatus	0.012	0.067	0.131	0.139	0.206	0.267	0.380	0.212	0.293	0.000	0.000	1.706
Ficus species	0.037	0.074	0.080	0.079	0.029	0.000	0.104	0.000	0.165	0.000	0.000	0.569
Gmelina arborea	0.010	0.055	0.015	0.023	0.029	0.000	0.074	0.000	0.165	0.000	0.000	0.370
Grewia tiliaefolia	0.021	0.015	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.060
Kydia calycina	0.033	0.065	0.120	0.034	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.252
Michelia champaca	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
Pinus khasya/insularis	0.013	0.023	0.087	0.274	0.400	0.156	0.302	0.000	0.000	0.377	0.262	1.895
Quercus serrata	0.108	0.266	0.346	0.275	0.458	0.292	0.412	0.093	0.144	0.000	0.000	2.394
Quercus species	0.347	0.548	0.552	0.430	0.255	0.284	0.396	0.000	0.000	0.000	0.000	2.820
Schima wallichi	0.048	0.086	0.056	0.019	0.092	0.000	0.116	0.089	0.000	0.000	0.000	0.506
Rest of species	1.498	2.778	2.369	1.941	2.388	2.347	2.481	1.913	1.561	1.405	2.255	22.838
All species total	2.632	4.868	4.465	3.236	4.172	3.686	4.749	2.422	2.487	1.782	2.761	37.760

Contents

Table No: 6.0.34.T(A)

CROP COMPOSITION - UPLAND HARDWOOD VOL.(000)CU.M. DISTT: UKHRUL AREA - 406.82 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	69-70	70-80	80+	Total
Albizzia lebbek	1.076	3.451	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.527
Alnus nepalensis	3.039	6.244	1.639	2.609	7.607	11.628	0.000	0.000	0.000	0.000	0.000	32.767
Bridalia retusa	0.037	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.037
Castanopsis hystrix	4.782	9.587	7.235	0.000	0.000	0.000	28.362	0.000	0.000	0.000	0.000	49.965
Castanopsis indica	1.960	4.278	7.277	0.000	0.000	0.000	8.245	0.000	0.000	0.000	0.000	21.760
Ficus species	1.509	1.541	3.528	8.383	3.804	7.311	19.628	0.000	0.000	0.000	0.000	45.702
Gmelina arborea	0.000	0.482	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.482
Kydia calycina	0.448	0.605	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.053
Michalia champaca	0.000	0.000	0.000	0.000	0.000	7.311	0.000	0.000	0.000	0.000	0.000	7.311
Pinus khasya/insularis	3.864	6.573	21.404	21.500	27.633	80.120	90.945	0.000	0.000	0.000	0.000	252.041
Quercus serrata	2.681	11.515	12.176	11.853	7.607	12.450	27.203	0.000	0.000	28.090	0.000	113.574
Quercus species	2.691	2.339	2.346	6.371	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.746
Schima wallichi	1.671	5.115	3.528	0.000	0.000	14.177	18.052	0.000	0.000	0.000	0.000	42.544
Rest of species	48.986	112.516	113.955	128.563	114.440	88.193	173.585	15.683	49.359	0.000	74.819	920.097
All species total	72.742	164.245	173.088	179.278	161.091	221.191	366.022	15.683	49.359	28.090	74.819	1505.607

Table No: 6.0.34.T(B)

CROP COMPOSITION - UPLAND HARDWOOD VOL./HA.CU.M. DISTT: UKHRUL AREA - 406.82 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	69-70	70-80	80+	Total
Albizzia lebbek	0.026	0.085	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.111
Alnus nepalensis	0.075	0.153	0.040	0.064	0.187	0.286	0.000	0.000	0.000	0.000	0.000	0.805
Bridalia retusa	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
Castanopsis hystrix	0.118	0.236	0.178	0.000	0.000	0.000	0.697	0.000	0.000	0.000	0.000	1.228
Castanopsis indica	0.048	0.105	0.179	0.000	0.000	0.000	0.203	0.000	0.000	0.000	0.000	0.535
Ficus species	0.037	0.038	0.087	0.206	0.093	0.180	0.482	0.000	0.000	0.000	0.000	1.123
Gmelina arborea	0.000	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012
Kydia calycina	0.011	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.026
Michalia champaca	0.000	0.000	0.000	0.000	0.000	0.180	0.000	0.000	0.000	0.000	0.000	0.180
Pinus khasya/insularis	0.095	0.162	0.526	0.529	0.679	1.969	2.236	0.000	0.000	0.000	0.000	6.195
Quercus serrata	0.066	0.283	0.299	0.291	0.187	0.306	0.669	0.000	0.000	0.690	0.000	2.792
Quercus species	0.066	0.057	0.058	0.157	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.338
Schima wallichi	0.041	0.126	0.087	0.000	0.000	0.348	0.444	0.000	0.000	0.000	0.000	1.046
Rest of species	1.204	2.766	2.801	3.160	2.813	2.169	4.267	0.385	1.213	0.000	1.839	22.617
All species total	1.788	4.037	4.255	4.407	3.960	5.437	8.997	0.385	1.213	0.690	1.839	37.009

Contents

Table No. 6.0.35.T(A)

CROP COMPOSITION - LOWLAND HARDWOOD VOL(000) cu.m. DISTT. TAMENGLONG AREA - 2135.47 Km2

Species description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	7.254	17.707	21.558	38.136	35.079	11.405	31.818	29.461	0.000	0.000	0.000	189.416
Albizzia procera	1.485	0.000	0.000	0.000	0.000	0.000	12.909	0.000	0.000	0.000	0.000	14.394
Alnus nepalensis	5.626	5.943	3.091	0.000	8.675	9.993	18.909	0.000	0.000	49.657	82.765	184.658
Bridelia retusa	0.448	0.000	8.583	0.000	0.000	9.322	0.000	0.000	42.343	0.000	0.000	60.696
Castanopsis hystrix	4.578	10.896	13.293	0.000	14.923	30.674	101.245	0.000	42.343	0.000	0.000	217.954
Castanopsis indica	0.461	0.000	0.000	0.000	6.872	0.000	0.000	0.000	0.000	0.000	0.000	7.333
Ficus species	4.278	5.095	5.101	0.000	6.872	9.322	0.000	28.051	0.000	0.000	219.572	276.892
Gmelina arborea	3.224	9.572	12.433	14.893	6.872	11.405	15.341	0.000	0.000	0.000	0.000	73.740
Grewia tiliaefolia	1.481	3.471	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.952
Kydia calycina	3.799	7.036	19.858	9.129	23.598	0.000	13.696	0.000	0.000	0.000	[illegible]	77.117
Michelia champaca	3.620	4.867	0.000	4.795	6.872	10.687	0.000	0.000	0.000	0.000	0.000	30.842
Quercus serrata	2.421	1.005	9.664	4.334	0.000	0.000	0.000	0.000	36.910	0.000	0.000	54.334
Quercus species	57.036	181.427	187.898	170.677	205.186	248.424	415.918	110.120	156.139	0.000	88.761	1821.585
Schima wallichi	25.119	68.062	126.020	72.599	107.607	117.121	184.205	175.937	38.234	153.640	239.407	1305.949
Rest of species	243.352	610.275	542.993	548.659	675.289	797.031	1033.396	445.722	881.118	363.558	1241.450	7382.832
All species total	364.181	925.358	950.490	860. 24	1097.847	1255.384	1827.436	785.291	1197.087	566.855	1871.955	11702.094

Contents

Table no. 6.0.35.T(8)

CROP COMPOSITION - LOWLAND HARDWOOD VOL./HA. CU.M. DISTT: TAMENGLONG AREA - 2135.47 Km2

Species description	Diameter classes (in cm.)										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.034	0.083	0.101	0.165	0.164	0.053	0.149	0.138	0.000	0.000	0.000	0.887
Albizzia procera	0.007	0.000	0.000	0.000	0.000	0.000	0.060	0.000	0.000	0.000	0.000	0.067
Alnus nepallensis	0.026	0.028	0.014	0.000	0.041	0.047	0.089	0.000	0.000	0.233	0.338	0.865
Bridelia retusa	0.002	0.000	0.040	0.000	0.000	0.044	0.000	0.000	0.198	0.000	0.000	0.284
Castanopsis hystrix	0.021	0.051	0.062	0.000	0.070	0.144	0.474	0.000	0.198	0.000	0.000	1.021
Castanopsis indica	0.002	0.000	0.000	0.000	0.032	0.000	0.000	0.000	0.000	0.000	0.000	0.034
Ficus species	0.020	0.024	0.024	0.000	0.032	0.044	0.000	0.122	0.000	0.000	1.028	1.294
Gmelina arborea	0.015	0.045	0.059	0.070	0.032	0.053	0.072	0.000	0.000	0.000	0.000	0.345
Grewia tiliaefolia	0.007	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023
Kydia calycina	0.018	0. [illegible]	0.093	0.043	0.111	0.000	0.064	0.000	0.000	0.000	0.000	0.361
Michelia champaca	0.017	0.023	0.000	0.022	0.032	0.050	0.000	0.000	0.000	0.000	0.000	0.144
Quercus serrata	0.011	0.005	0.045	0.020	0.000	0.000	0.000	0.000	0.173	0.000	0.000	0.254
Quercus species	0.267	0.850	0.880	0.799	0.961	1.153	1.948	0.516	0.731	0.000	0.416	8.530
Schima wallichii	0.118	0.31	0.590	0.340	0.504	0.548	0.863	0.815	0.179	0.719	1.121	6.116
Rest of species	1.140	2.858	2.543	2.569	3.162	3.732	4.839	2.087	4.126	1.702	5.813	34.572
All species total	1.705	4.333	4.451	4.028	5.141	5.879	8.558	3.677	5.605	2.654	8.766	54.799

Contents

Table No. 6.0.36.T(A)

CROP COMPOSITION - UPLAND HARDWOOD VOL(000) cu.m. DISTT. TAMENGLONG AREA - 261.90 Km2

Species description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Alnus napalensis	1.833	6.080	2.426	9.804	0.000	0.000	0.000	24.368	0.000	0.000	0.000	44.510
Ficus species	0.000	1.258	6.328	0.000	0.000	0.000	29.613	0.000	0.000	0.000	0.000	37.199
Kydia calycina	0.332	0.816	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.148
Macaranga denticulata	0.332	0.816	0.000	0.000	0.000	0.000	13.165	0.000	0.000	0.000	63.813	70.127
Quercus species	11.959	35.533	29.499	32.401	24.632	33.477	127.949	0.000	38.992	107.585	152.479	594.504
Schima wallichi	1.170	7.224	11.099	9.310	13.452	0.000	0.000	26.567	0.000	0.000	0.000	68.824
Rest of species	35.042	81.620	152.465	84.833	116.678	56.809	270.602	169.676	245.221	101.308	471.362	1785.616
All species total	50.670	133.346	201.817	136.349	154.762	90.286	441.329	220.612	284.212	208.892	687.654	2609.927

Table No. 6.0.36.T(B)

CROP COMPOSITION - UPLAND HARDWOOD VOL./HA. cu.m. DISTT. TAMENGLONG AREA - 261.90 Km2

Species description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Alnus napalensis	0.070	0.232	0.093	0.374	0.000	0.000	0.000	0.930	0.000	0.000	0.000	1.700
Ficus species	0.000	0.048	0.242	0.000	0.000	0.000	1.131	0.000	0.000	0.000	0.000	1.420
Kydia calycina	0.013	0.031	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.044
Macaranga denticulata	0.013	0.031	0.000	0.000	0.000	0.000	0.503	0.000	0.000	0.000	2.437	2.983
Quercus species	0.457	1.357	1.126	1.237	0.941	1.278	4.886	0.000	1.489	4.108	5.822	22.701
Schima wallichi	0.045	0.276	0.424	0.356	0.514	0.000	0.000	1.014	0.000	0.000	0.000	2.628
Rest of species	1.338	3.117	5.822	3.239	4.455	2.169	10.333	6.479	9.364	3.868	17.998	68.182
All species total	1.935	5.092	7.706	5.206	5.909	3.447	16.852	8.424	10.852	7.976	26.257	99.657

Contents

Table No. 6.0.36.T(A)

CROP COMPOSITION - UPLAND HARDWOOD VOL(000) cu.m. DISTT. TAMENGLONG AREA - 261.90 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Alnus nepalensis	1.833	6.080	2.426	9.804	0.000	0.000	0.000	24.368	0.000	0.000	0.000	44.510
Ficus species	0.000	1.258	6.329	0.000	0.000	0.000	29.613	0.000	0.000	0.000	0.000	37.199
Kydia calycina	0.332	0.816	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.148
Macaranga denticulata	0.332	0.816	0.000	0.000	0.000	0.000	13.165	0.000	0.000	0.000	63.813	70.127
Quercus species	11.959	35.533	29.499	32.401	24.632	33.477	127.949	0.000	38.992	107.585	152.479	594.504
Schima wallichi	1.170	7.224	11.099	9.310	13.452	0.000	0.000	26.567	0.000	0.000	0.000	68.824
Rest of species	35.042	81.620	152.465	84.833	116.678	56.309	270.602	169.676	245.221	101.308	471.362	1785.616
All species total	50.670	133.346	201.817	136.349	154.762	90.286	441.329	220.612	284.212	208.892	687.654	2609.927

Table No. 6.0.36.T(B)

CROP COMPOSITION - UPLAND HARDWOOD VOL./HA. cu.m. DISTT. TAMENGLONG AREA - 261.90 Km2

Species description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Alnus nepalensis	0.070	0.232	0.093	0.374	0.000	0.000	0.000	0.930	0.000	0.000	0.000	1.700
Ficus species	0.000	0.048	0.242	0.000	0.000	0.000	1.131	0.000	0.000	0.000	0.000	1.420
Kydia calycina	0.013	0.031	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.044
Macaranga denticulata	0.013	0.031	0.000	0.000	0.000	0.000	0.503	0.000	0.000	0.000	2.437	2.983
Quercus species	0.457	1.357	1.126	1.237	0.941	1.278	4.886	0.000	1.499	4.108	5.822	22.701
Schima wallichi	0.045	0.276	0.424	0.356	0.514	0.000	0.000	1.014	0.000	0.000	0.000	2.628
Rest of species	1.338	3.117	5.822	3.239	4.455	2.169	10.333	6.479	9.364	3.868	17.998	68.182
All species total	1.935	5.092	7.706	5.206	5.909	3.447	16.852	8.424	10.852	7.976	26.257	99.657

Table No. 6.0.37.T(A)

CROP COMPOSITION - BAMBOO BRAKES VOL.(000)cu.m. DISTT. TAMENGLONG AREA - 533.87 Km2

Species description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia procera	0.748	3.458	2.241	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.446
Castanopsis hystrix	1.499	1.486	1.957	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.941
Ficus species	0.379	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.379
Gmelina arborea	0.000	0.827	4.198	0.000	0.000	0.000	29.615	0.000	0.000	0.000	0.000	34.640
Kydia calycina	1.207	2.669	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.876
Quercus species	0.917	7.257	0.000	8.329	0.000	0.000	0.000	0.000	0.000	0.000	0.000	16.503
Schima wallichi	1.457	4.756	1.957	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.171
Rest of species	7.762	8.743	8.293	28.439	18.925	9.385	42.493	17.964	0.000	0.000	0.000	142.004
All species total	13.967	29.196	18.647	36.768	18.925	9.385	72.108	17.964	0.000	0.000	0.000	216.960

Table No. 6.0.37.T(B)

CROP COMPOSITION - BAMBOO BRAKES VOL./HA. cu.m. DISTT. TAMENGLONG AREA - 533.87 Km2

Species description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia procera	0.014	0.065	0.042	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.121
Castanopsis hystrix	0.028	0.028	0.037	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.093
Ficus species	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007
Gmelina arborea	0.000	0.015	0.079	0.000	0.000	0.000	0.555	0.000	0.000	0.000	0.000	0.649
Kydia calycina	0.023	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.073
Quercus species	0.017	0.136	0.000	0.156	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.309
Schima wallichi	0.027	0.089	0.037	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.153
Rest of species	0.145	0.164	0.155	0.533	0.354	0.176	0.796	0.336	0.000	0.000	0.000	2.660
All species total	0.262	0.547	0.349	0.689	0.354	0.176	1.351	0.336	0.000	0.000	0.000	4.064

Contents

Table no. 6.0.38.T(A)

CROP COMPOSITION CONIFERS VOL(000)CU.M. DISTT. CHANDEL AREA - 38.61 Km2

Species Description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Castanopsis hystrix	3.891	7.136	0.000	4.128	15.573	0.000	0.000	0.000	0.000	0.000	0.000	30.728
Kydia calycina	0.060	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.060
Pinus khasya/insularis	0.367	1.792	9.820	21.958	24.741	20.087	28.057	0.000	0.000	0.000	0.000	106.823
Quercus serrata	0.670	1.720	0.000	4.128	7.096	9.518	15.420	0.000	0.000	0.000	0.000	38.560
Quercus species	0.601	2.666	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.267
Rest of species	1.243	3.852	0.000	2.756	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.851
All species total	6.833	17.166	9.820	32.971	47.410	29.606	43.485	0.000	0.000	0.000	0.000	187.290

Table no. 6.0.38.T(B)

CROP COMPOSITION - CONIFERS VOL/HA.CU.M. DISTT. CHANDEL AREA - 38.61 Km2

Species Description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Castanopsis hystrix	1.007	1.848	0.000	1.069	4.032	0.000	0.000	0.000	0.000	0.000	0.000	7.956
Kydia calycina	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016
Pinus khasya/insularis	0.095	0.464	2.543	5.686	6.406	5.201	7.265	0.000	0.000	0.000	0.000	27.660
Quercus serrata	0.174	0.445	0.000	1.069	1.837	2.465	3.995	0.000	0.000	0.000	0.000	9.985
Quercus species	0.156	0.690	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.846
Rest of species	0.322	0.997	0.000	0.714	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.033
All species total	1.769	4.445	2.543	8.537	12.276	7.666	11.260	0.000	0.000	0.000	0.000	43.496

Table no. 6.0.39.T(A)

CROP COMPOSITION - LOWLAND HARDWOOD VOL(000) CU.M.   DISTT. CHANDEL   AREA - 1795.64 Km2

Species Description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	3.151	3.590	4.430	3.764	6.991	4.640	6.661	0.000	0.000	0.000	0.000	33.226
Albizzia procera	1.187	0.535	5.238	0.000	3.235	0.000	13.321	0.000	0.000	0.000	0.000	23.516
Alnus nepalensis	0.509	3.552	9.179	27.968	40.040	9.280	41.553	0.000	0.000	0.000	0.000	132.081
Bridelia retusa	1.812	1.390	3.383	3.764	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.348
Callicarpa arborea	4.456	1.568	10.497	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	16.520
Castanopsis hystrix	76.606	156.005	145.034	123.531	160.388	104.453	107.586	38.798	0.000	0.000	0.000	912.399
Castanopsis indica	13.896	25.645	23.986	4.584	21.679	8.677	5.605	0.000	0.000	43.120	0.000	147.193
Dipterocarpus turbinatus	5.871	15.061	18.249	24.223	58.845	72.575	190.580	98.401	96.213	133.412	210.427	923.857
Ficus species	5.928	5.059	20.247	5.025	0.000	0.000	22.245	0.000	0.000	0.000	0.000	58.504
Gmelina arborea	0.093	1.418	2.524	0.000	11.955	9.903	12.597	0.000	0.000	0.000	0.000	38.491
Grewia tiliaefolia	2.454	6.894	4.430	12.912	3.766	10.546	0.000	0.000	0.000	0.000	0.000	41.002
Kydia calycina	1.275	5.168	4.376	17.096	3.495	0.000	0.000	0.000	0.000	0.000	0.000	31.410
Macaranga denticulata	1.428	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.428
Michelia champaca	0.506	2.142	3.866	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.514
Pinus khasya/insularis	3.356	5.765	10.208	16.668	17.769	43.377	95.983	10.254	0.000	0.000	0.000	203.361
Quercus serrata	1.540	10.106	5.707	4.164	6.469	31.376	67.362	0.000	103.168	0.000	156.077	385.969
Quercus species	66.311	168.803	196.716	182.079	242.350	177.691	111.216	42.544	0.000	0.000	0.000	1187.709
Schima wallichi	6.095	12.483	11.564	12.953	20.010	9.903	46.261	27.658	0.000	0.000	141.985	288.910
Rest of species	295.864	743.071	717.355	474.864	667.876	587.036	621.627	408.222	339.518	371.297	893.622	6200.344
All species total	492.306	1168.254	1196.990	913.595	1264.869	1069.458	1342.595	705.875	538.899	547.829	1402.110	10642.781

Contents

Table no. 6.0.39.T(B)

CROP COMPOSITION - LOWLAND HARDWOOD VOL./HA. CU.M. DISTT. CHANDEL AREA - 1795.64 Km2

Species Description	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.018	0.020	0.025	0.021	0.039	0.026	0.037	0.000	0.000	0.000	0.000	0.185
Albizzia procera	0.007	0.003	0.029	0.000	0.018	0.000	0.074	0.000	0.000	0.000	0.000	0.131
Alnus nepalensis	0.003	0.021	0.051	0.156	0.223	0.062	0.231	0.000	0.000	0.000	0.000	0.[illegible]36
Bridelia retusa	0.010	0.008	0.019	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.058
Callicarpa arborea	0.025	0.009	0.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.092
Castanopsis hystrix	0.427	0.869	0.800	0.638	0.[illegible]93	0.582	0.599	0.216	0.000	0.000	0.000	5.031
Castanopsis indica	0.077	0.143	0.134	0.026	0.121	0.048	0.031	0.000	0.000	0.240	0.000	0.820
Dipterocarpus turbinatus	0.033	0.084	0.102	0.135	0.[illegible]28	0.404	1.061	0.548	0.536	0.743	1.172	5.145
Ficus species	0.033	0.028	0.113	0.028	0.[illegible]00	0.000	0.124	0.000	0.000	0.000	0.000	0.326
Gmelina arborea	0.001	0.008	0.014	0.000	0.[illegible]67	0.055	0.070	0.000	0.000	0.000	0.000	0.214
Grewia tiliaefolia	0.014	0.038	0.025	0.072	0.[illegible]21	0.059	0.000	0.000	0.000	0.000	0.000	0.226
Kydia calycina	0.007	0.029	0.024	0.095	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.[illegible]75
Macaranga denticulata	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
Michelia champaca	0.003	0.012	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.036
Pinus khasya/insularis	0.019	0.032	0.057	0.093	0.[illegible]99	0.242	0.535	0.057	0.000	0.000	0.000	1.133
Quercus serrata	0.009	0.056	0.032	0.023	0.036	0.175	0.375	0.000	0.575	0.000	0.869	2.149
Quercus species	0.369	0.940	1.096	1.014	1.[illegible]50	0.990	0.619	0.237	0.000	0.000	0.000	6.614
Schima wallichi	0.034	0.070	0.064	0.072	0.[illegible]11	0.055	0.258	0.154	0.000	0.000	0.791	1.609
Rest of species	1.648	4.138	3.995	2.643	3.729	3.269	3.462	2.719	1.891	2.068	4.977	34.530
All species total	2.742	6.506	6.666	5.088	7.044	5.956	7.477	3.931	3.001	3.051	7.808	59.270

Contents

Table no. 6.0.40.T(A)

CROP COMPOSITION - UPLAND HARDWOOD VOL.(000)CU.M. DISTT. CHANDEL AREA - 77.23 Km2

Species Description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.000	0.000	0.000	4.567	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.567
Quercus species	7.778	20.754	5.209	31.641	12.034	21.722	13.044	0.000	0.000	0.000	0.000	112.182
Schima wallichi	0.589	1.959	0.000	4.567	6.545	0.000	18.008	29.184	0.000	0.000	0.000	60.853
Rest of species	29.786	91.305	78.256	57.702	68.311	36.152	26.859	47.742	36.412	0.000	75.125	547.650
All species total	38.154	114.019	83.465	98.476	86.890	57.874	57.911	76.926	36.412	0.000	75.125	725.251

Table no. 6.0.40.T(B)

CROP COMPOSITION - UPLAND HARDWOOD VOL./HA. CU.M. DISTT. CHANDEL AREA - 77.23 Km2

Species Description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.000	0.000	0.000	0.591	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.591
Quercus species	1.007	2.687	0.674	4.097	1.558	2.813	1.689	0.000	0.000	0.000	0.000	14.526
Schima wallichi	0.076	0.254	0.000	0.591	0.847	0.000	2.332	3.779	0.000	0.000	0.000	7.879
Rest of species	3.857	11.823	10.133	7.471	8.845	4.681	3.478	6.182	4.715	0.000	9.727	70.912
All species total	4.940	14.764	10.807	12.751	11.251	7.494	7.499	9.961	4.715	0.000	9.727	93.908

Contents

Table no. 6.0.41. T(A)

CROP COMPOSITION - BAMBOO BRAKES VOL (000) CU.M. DISTT. CHANDEL AREA - 212.39 Km2

Species Description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.300	0.000	5.229	0.000	0.000	15.475	0.000	23.834	26.648	0.000	0.000	71.486
Albizzia procera	0.338	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.338
Callicarpa arborea	0.234	0.599	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.833
Ficus species	0.000	0.599	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.599
Gmelina arborea	0.589	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.589
Grewia tiliaefolia	0.094	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.094
Kydia calycina	0.140	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.140
Quercus species	0.463	2.821	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.284
Schima wallichi	0.000	0.000	1.780	3.588	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.368
Rest of species	9.907	19.508	15.820	16.580	29.293	24.529	62.651	18.678	0.000	0.000	0.000	196.966
All species total	12.065	23.527	22.828	20.168	29.293	40.004	62.651	42.512	26.648	0.000	0.000	279.696

Table no. 6.0.41.T(B)

CROP COMPOSITION - BAMBOO BRAKES VOL./HA. CU.M. DISTT: - CHANDEL AREA - 212.39 Km2

Species Description	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.014	0.000	0.246	0.000	0.000	0.729	0.000	1.122	1.255	0.000	0.000	[illegible]
Albizzia procera	0.016	0.000	0.000	0.000	[illegible]	0.000	0.000	0.000	0.000	0.000	0.000	0.016
Callicarpa arborea	0.011	0.028	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016
Ficus species	0.000	0.028	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	[illegible]
Gmelina arborea	0.028	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.028
Grewia tiliaefolia	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.028
Kydia calycina	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	[illegible]	0.000	0.007
Quercus species	0.022	0.133	0.000	0.000	0.000	0.000	0.000	0.000	0.000	[illegible]	0.000	0.155
Schima wallichi	0.000	0.000	0.084	0.169	[illegible]	0.000	0.000	0.000	0.000	0.000	0.000	0.253
Rest of species	0.466	0.919	0.745	0.781	1.379	1.155	2.950	0.879	0.000	0.000	0.000	9.274
All species total	0.563	1.108	1.075	0.950	1.379	1.884	2.950	2.002	1.255	0.000	0.000	13.169

Contents

Table No. 6.0.42.T(A)

CROP COMPOSITION - CONIFERS VOL(000) CU.M. ENTIRE STATE AREA - 196.38 Km2

Species Name	Diameter classes in c.m.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Albizzia procera	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alnus nepalensis	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Bridelia retusa	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Callicarpa arborea	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Castanopsis hystrix	5.367	11.886	6.143	6.574	23.018	0.000	8.658	0.000	0.000	0.000	0.000	61.646
Castanopsis indica	0.164	0.567	0.000	0.000	4.205	6.032	0.000	0.000	0.000	0.000	0.000	10.988
Dipterocarpus turbinatus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Fi s species	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Gmelina arborea	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Grewia tiliaefolia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Kydia calycina	0.414	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.414
Lagerstroemia flosreginae	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Macaranga denticulata	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Michelia champaca	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pinus khasya/insularis	14.149	66.502	173.951	178.710	150.748	133.025	182.061	43.449	16.384	22.167	0.000	1001.146
Quercus serrata	0.670	1.720	0.000	4.128	7.096	9.518	15.426	0.000	0.000	0.000	0.000	38.560
Quercus species	5.739	14.495	13.224	10.347	14.774	9.305	28.917	0.000	0.000	0.000	0.000	96.801
Schima wallichi	0.376	0.452	0.000	2.446	3.566	0.000	0.000	0.000	0.000	0.000	0.000	6.840
Rest of species	14.250	24.699	33.989	35.345	36.631	23.483	32.368	0.000	0.000	0.000	0.000	200.765
All species total	41.149	140.321	227.307	237.550	240.033	181.363	267.432	43.449	16.384	22.167	0.000	1417.160

Table No. 6.0.42.F(B)

CROP COMPOSITION - CONIFERS VOL/HA.CU.M. ENTIRE STATE AREA - 198.38 Km2

Species Name	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Albizzia procera	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alnus nepalensis	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Bridelia retusa	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Callicarpa arborea	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Castanopsis hystrix	0.271	0.599	0.310	0.331	1.160	0.000	0.436	0.000	0.000	0.000	0.000	3.107
Castanopsis indica	0.009	0.025	0.000	0.000	0.212	0.304	0.000	0.000	0.000	0.000	0.000	0.554
Dipterocarpus turbinatus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ficus species	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Gmelina arborea	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Grewia tiliaefolia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Kydia calycina	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.021
Lagerstroemia flosreginae	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Macaranga denticulata	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Michelia champaca	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pinus khasya/insularis	0.713	4.360	8.769	9.009	7.599	6.706	9.177	2.190	0.826	1.117	0.000	50.466
Quercus serrata	0.034	0.087	0.000	0.208	0.358	0.480	0.778	0.000	0.000	0.000	0.000	1.945
Quercus species	0.289	0.731	0.667	0.522	0.745	0.469	1.458	0.000	0.000	0.000	0.000	4.881
Schima wallichi	0.019	0.023	0.000	0.123	0.180	0.000	0.000	0.000	0.000	0.000	0.000	0.345
Rest of species	0.718	1.245	1.713	1.782	1.847	1.164	1.632	0.000	0.000	0.000	0.000	10.121
All species total	2.074	7.074	11.459	11.975	12.102	9.143	13.481	2.190	0.826	1.117	0.000	71.440

Table No.6.0.43.T(A)

CROP COMPOSITION - LOWLAND HARDWOOD VOL.(000) CU.M. ENTIRE STATE AREA - 8348.28 Km2

Species Name	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	27.426	65.492	62.295	69.646	76.666	42.723	77.110	47.119	0.000	0.000	0.000	468.477
Albizzia procera	9.507	15.890	22.225	40.712	9.929	5.990	33.967	0.000	0.000	0.000	0.000	138.220
Alnus nepalensis	18.516	38.400	25.399	33.289	57.443	30.243	112.153	12.977	24.544	49.657	157.508	560.131
Bridelia retusa	4.240	6.222	13.598	11.863	0.000	9.322	29.905	25.482	79.927	0.000	0.000	180.559
Callicarpa arborea	18.590	26.829	23.431	5.582	0.000	5.050	17.565	0.000	0.000	0.000	0.000	97.047
Castanopsis hystrix	133.872	274.197	312.782	266.944	261.247	235.261	356.124	59.553	69.851	0.000	0.000	1969.831
Castanopsis indica	61.279	105.032	97.459	50.873	84.755	41.256	53.533	0.000	0.000	43.120	37.503	574.810
Dipterocarpus turbinatus	7.664	25.414	38.367	45.586	90.518	113.739	249.040	131.089	141.251	133.412	210.427	1186.507
Ficus species	37.315	42.202	76.383	43.237	30.499	26.557	105.626	44.203	54.990	42.566	419.659	923.237
Gmelina arborea	9.226	39.786	57.312	44.319	48.822	52.181	96.069	0.000	62.963	0.000	271.630	682.308
Grewia tiliaefolia	23.241	32.404	32.079	36.153	3.766	10.546	0.000	0.000	0.000	0.000	0.000	138.189
Kydia calycina	21.122	47.494	59.308	58.533	43.405	11.745	19.063	0.000	0.000	0.000	0.000	240.670
Lagerstroemia flosreginae	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Macaranga denticulata	1.549	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.549
Michelia champaca	4.645	7.464	3.866	8.782	6.672	10.687	0.000	0.000	0.000	0.000	0.000	42.316
Pinus khasya insularis	6.126	12.843	38.370	73.440	97.261	80.533	178.275	34.481	0.000	58.040	96.112	675.481
Quercus serrata	20.530	52.108	68.594	50.851	77.000	76.340	145.024	14.321	162.201	0.000	156.077	823.046
Quercus species	267.704	634.001	714.953	613.047	760.063	684.630	781.063	241.475	156.139	0.000	88.761	4941.836
Schima wallichi	84.364	197.411	239.049	178.320	222.607	223.781	379.569	299.665	68.926	153.640	430.106	2477.438
Rest of species	1149.812	2562.210	2409.193	1842.235	2446.823	2316.097	3065.048	1665.441	1841.845	1569.339	3752.921	24620.864
All species total	1906.730	4185.399	4294.655	3453.420	4317.676	3976.681	5699.134	2575.806	2662.637	2049.774	5620.604	40742.516

Table No. 6.0.43.T(B)

CROP COMPOSITION - LOWLAND HARDWOOD VOL/HA.CU.M. ENTIRE STATE AREA - 8348.28 Km2

Species Name	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.033	0.079	0.075	0.083	0.092	0.051	0.092	0.056	0.000	0.000	0.000	0.561
Albizzia procera	0.011	0.019	0.027	0.049	0.012	0.007	0.041	0.000	0.000	0.000	0.000	0.166
Alnus nepalensis	0.022	0.046	0.030	0.040	0.069	0.036	0.134	0.016	0.029	0.059	0.189	0.670
Bridelia retusa	0.005	0.007	0.016	0.014	0.000	0.011	0.036	0.031	0.096	0.000	0.000	0.216
Callicarpa arborea	0.022	0.032	0.028	0.007	0.000	0.007	0.021	0.000	0.000	0.000	0.000	0.117
Castanopsis hystrix	0.160	0.328	0.375	0.320	0.313	0.282	0.427	0.071	0.084	0.000	0.000	2.360
Castanopsis indica	0.073	0.126	0.117	0.061	0.102	0.049	0.064	0.000	0.000	0.052	0.045	0.689
Dipterocarpus turbinatus	0.009	0.030	0.046	0.055	0.108	0.136	0.298	0.157	0.169	0.160	0.252	1.420
Ficus species	0.045	0.051	0.091	0.052	0.037	0.032	0.127	0.053	0.066	0.051	0.503	1.108
Gmelina arborea	0.011	0.048	0.069	0.053	0.058	0.063	0.115	0.000	0.075	0.000	0.325	0.817
Grewia tiliaefolia	0.028	0.039	0.038	0.043	0.005	0.013	0.000	0.000	0.000	0.000	0.000	0.166
Kydia glycina	0.025	0.057	0.071	0.046	0.052	0.014	0.023	0.000	0.000	0.000	0.000	0.288
Lagerstroemia flosreginae	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Macaranga denticulata	0.002	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.002
Michelia champaca	0.006	0.009	0.005	0.010	0.008	0.013	0.000	0.000	0.000	0.000	0.000	0.051
Pinus khasya/insularis	0.007	0.015	0.046	0.088	0.117	0.096	0.214	0.041	0.000	0.070	0.115	0.809
Quercus serrata	0.025	0.062	0.082	0.061	0.092	0.091	0.174	0.017	0.194	0.000	0.187	0.985
Quercus species	0.321	0.759	0.856	0.734	0.710	0.820	0.936	0.289	0.187	0.000	0.106	5.918
Schima wallichi	0.101	0.236	0.286	0.214	0.267	0.268	0.455	0.359	0.083	0.184	0.515	2.968
Rest of species	1.377	3.064	2.886	2.207	2.931	2.774	3.671	1.995	2.206	1.860	4.495	29.491
All species total	2.283	5.012	5.144	4.137	5.173	4.763	6.828	3.085	3.189	2.456	6.732	48.802

Contents

Table No. 6.0.44.T(A)

CROP COMPOSITION - UPLAND HARDWOOD VOL(000)CU.M. ENTIRE STATE AREA - 1125.31 Km2

Species Name	Diameter classes in cm. 10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	1.343	3.451	0.000	4.567	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.361
Albizzia procera	0.267	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.267
Alnus nepalensis	11.565	23.575	11.285	26.058	11.917	30.191	38.558	68.403	49.049	30.516	37.196	338.318
Bridelia retusa	0.037	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.037
Callicarpa arborea	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Castanopsis hystrix	15.844	33.955	34.617	15.545	12.985	0.000	37.733	0.000	0.000	0.000	0.000	150.679
Castanopsis indica	2.798	4.278	7.277	0.000	4.658	0.000	8.245	0.000	0.000	0.000	0.000	27.256
Dipterocarpus turbinatus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ficus species	2.131	2.799	11.644	8.383	3.804	7.311	49.241	0.000	0.000	0.000	0.000	85.313
Gmelina arborea	0.000	0.482	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.482
Grewia tiliaefolia	0.203	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.203
Kydia calycina	1.157	1.421	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.578
Lagerstroemia flosreginae	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Macaranga denticulata	0.332	0.816	0.000	0.000	0.000	0.000	13.165	0.000	0.000	0.000	63.813	78.126
Michelia champaca	0.189	0.000	2.014	0.000	0.000	7.311	0.000	0.000	0.000	27.856	0.000	37.370
Pinus khasya/insularis	5.764	16.170	41.028	37.105	67.600	104.112	108.465	0.000	0.000	0.000	0.000	380.244
Quercus serrata	2.681	11.515	12.176	11.853	7.607	12.450	27.203	0.000	0.000	28.090	0.000	113.575
Quercus species	33.441	68.636	48.403	79.043	62.969	94.761	157.337	59.349	63.489	138.101	242.653	1048.182
Schima wallichi	4.974	17.351	22.665	16.651	36.101	25.038	36.060	55.751	0.000	0.000	0.000	214.591
Rest of species	196.047	426.659	465.862	418.638	496.867	423.056	816.023	336.097	500.959	396.030	1276.647	5752.925
All species total	278.773	611.108	656.971	617.843	704.508	704.230	1292.030	519.600	613.537	620.593	1620.309	8239.502

Contents

Table No. 6.0.44.T(B)

CROP COMPOSITION - UPLAND HARDWOOD VOL/HA. CU.M. ENTIRE STATE AREA - 1125.31 Km2

Species Name	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.012	0.030	0.000	0.041	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.083
Albizzia procera	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
Alnus nepalensis	0.103	0.209	0.100	0.232	0.106	0.260	0.343	0.608	0.436	0.271	0.331	3.007
Bridelia retusa	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
Callicarpa arborea	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Castanopsis hystrix	0.141	0.302	0.303	0.138	0.115	0.000	0.335	0.000	0.000	0.000	0.000	1.339
Castanopsis indica	0.025	0.038	0.065	0.000	0.041	0.000	0.073	0.000	0.000	0.000	0.000	0.242
Dipterocarpus turbinatus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ficus species	0.019	0.025	0.103	0.074	0.034	0.065	0.438	0.000	0.000	0.000	0.000	0.758
Gmelina arborea	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004
Grewia tiliaefolia	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
Kydia calycina	0.010	0.013	0.000	0.000	0.000	0.000	0.000	0.000	.000	0.000	0.000	0.023
Lagerstroemia flosreginae	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Macaranga denticulata	0.003	0.007	0.000	0.000	0.000	0.000	0.117	0.000	0.000	0.000	0.567	[illegible]
Michelia champaca	0.002	0.000	0.018	0.000	0.000	0.065	0.000	0.000	0.000	0.248	0.000	0.333
Pinus khasya/insularis	0.051	0.144	0.365	0.329	0.501	0.925	0.964	0.000	0.000	0.000	0.000	3.379
Quercus semiserrata	0.024	0.102	0.108	0.105	0.068	0.111	0.242	0.000	0.000	0.249	0.000	1.009
Quercus species	0.297	0.610	0.430	0.702	0.560	0.842	1.397	0.527	0.564	1.227	2.156	4.313
Schima wallichi	0.044	0.154	0.201	0.148	0.321	0.223	0.320	0.495	0.000	0.000	0.000	1.906
Rest of species	1.742	3.791	4.140	3.720	4.415	3.759	7.252	2.987	4.452	3.519	11.345	51.122
All species total	2.478	5.429	5.830	5.469	6.261	6.258	11.482	4.617	5.452	5.514	14.399	73.217

Table No. 6.0.45.T(A)

CROP COMPOSITION - BAMBOO BRAKES VOLUME CU.M. ENTIRE STATE AREA - 1591.93 Km2

Species Name	Diameter classes in cm.											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.577	0.000	5.229	0.000	0.000	15.475	0.000	23.834	26.648	0.000	0.000	71.763
Albizzia procera	1.086	3.456	2.241	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.783
Alnus nepalensis	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Bridelia retusa	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Callicarpa arborea	3.960	2.018	2.429	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.407
Castanopsis hystrix	1.542	1.486	1.957	3.683	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.668
Castanopsis indica	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Dipterocarpus turbinatus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ficus species	1.213	0.878	0.000	3.024	0.000	0.000	13.855	0.000	0.000	0.000	0.000	18.970
Gmelina arborea	1.322	1.528	6.354	0.000	0.000	0.000	29.615	0.000	0.000	0.000	0.000	38.819
Grewia tiliaefolia	0.327	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.327
Kydia calycina	1.347	2.669	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.016
Lagerstroemia flosreginae	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Macaranga denticulata	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Michelia champaca	0.000	0.000	0.000	0.000	2.806	0.000	0.000	0.000	0.000	0.000	0.000	2.806
Pinus khasya/insularis	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Quercus serrata	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Quercus species	1.851	10.876	3.599	9.731	0.000	0.000	0.000	0.000	0.000	0.000	0.000	26.057
Schima wallichii	2.954	6.576	5.765	8.014	4.794	3.232	0.000	8.785	0.000	0.000	0.000	40.121
Rest of species	58.400	64.490	61.801	88.875	119.614	55.792	193.979	105.551	25.273	71.440	153.585	978.813
All species total	54.587	93.979	89.376	113.327	127.214	74.504	237.449	138.170	51.921	71.440	153.585	1205.552

Table No. 6.0.45.T(8)

CROP COMPOSITION BAMBOO BRAKES VOL/HA. CU.M. ENTIRE STATE AREA - 1591.93 Km2

Species Name	Diameter classes											
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.004	0.000	0.033	0.000	0.000	0.097	0.000	0.150	0.167	0.000	0.000	0.451
Albizzia procera	0.007	0.022	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.043
Alnus nepalensis	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Bridelia retusa	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Callicarpa arborea	0.025	0.013	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.053
Castanopsis hystrix	0.010	0.009	0.012	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.054
Castanopsis indica	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Dipterocarpus turbinatus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ficus species	0.008	0.005	0.000	0.019	0.000	0.000	0.087	0.000	0.000	0.000	0.000	0.119
Gmelina arborea	0.008	0.010	0.040	0.000	0.000	0.000	0.186	0.000	0.000	0.000	0.000	0.244
Grewia tiliaefolia	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
Kydia calycina	0.009	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.026
Lagerstroemia flosreginae	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Macaranga denticulata	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Michelia champaca	0.000	0.000	0.000	0.000	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.018
Pinus khasya/insularis	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Quercus serrata	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Quercus species	0.012	0.068	0.023	0.061	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.164
Schima wallichi	0.019	0.041	0.036	0.050	0.030	0.020	0.000	0.055	0.000	0.000	0.000	0.251
Rest of species	0.241	0.405	0.388	0.558	0.751	0.351	1.219	0.663	0.159	0.449	0.965	6.149
All species total	0.345	0.590	0.561	0.711	0.799	0.468	1.492	0.868	0.326	0.449	0.96[illegible]	7.574

Contents

Table No. 6.0.46.T(A)

CROP COMPOSITION - ALL COMBINED VOL.(000) cu.m. ENTIRE STATE AREA - 11263.90 Km2

Species Name	Diameter classes in cm. 10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	29.346	68.943	67.524	74.213	76.666	53.198	77.110	70.953	26.648	0.000	0.000	549.601
Albizzia procera	10.860	19.348	24.466	40.712	9.929	5.990	33.967	0.000	0.000	0.000	0.000	145.272
Alnus nepalensis	30.083	61.975	36.684	59.347	69.360	60.434	150.711	81.380	73.593	80.173	194.704	898.444
Bridelia retusa	4.277	6.222	13.598	11.863	0.000	9.322	29.905	25.482	79.927	0.000	0.000	180.596
Callicarpa arborea	22.550	28.847	25.860	5.582	0.000	5.050	17.565	0.000	0.000	0.000	0.000	105.454
Castanopsis hystrix	156.625	321.524	355.499	292.746	297.250	235.261	402.515	59.553	69.851	0.000	0.000	2190.824
Castanopsis indica	64.261	109.877	104.736	50.873	93.618	47.288	61.776	0.000	0.000	43.120	37.503	613.054
Dipterocarpus turbinatus	7.664	25.414	38.367	45.586	90.518	113.739	249.040	131.089	141.251	133.412	210.427	1186.507
Ficus species	40.659	45.079	88.027	54.644	34.303	33.866	168.722	44.203	54.990	42.566	419.659	1027.520
Gmelina arborea	10.548	41.796	63.666	44.319	48.622	52.181	125.684	0.000	62.963	0.000	271.630	721.609
Grewia tiliaefolia	23.771	32.404	32.079	36.153	3.766	10.546	0.000	0.000	0.000	0.000	0.000	138.719
Mydia calycina	24.040	51.584	59.308	38.583	43.405	11.745	19.063	0.000	0.000	0.000	0.000	247.678
Lagerstroemia flosreginae	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Macaranga denticulata	1.881	0.816	0.000	0.000	0.000	0.000	13.165	0.000	0.000	0.000	63.813	79.675
Michelia champaca	4.834	7.464	5.880	8.782	9.678	17.998	0.000	0.000	0.000	27.856	0.000	82.492
Pinus khasya/ insularis	26.039	115.515	253.349	289.255	315.609	317.670	468.801	77.930	16.384	80.207	96.112	2056.871
Quercus serrata	23.881	65.343	80.770	66.832	91.773	95.308	187.655	14.321	162.201	28.090	156.077	972.181
Quercus species	408.735	728.008	780.179	712.168	837.806	783.696	967.317	300.824	219.628	138.101	331.414	6112.876
Schima wallichi	92.668	221.790	267.472	205.439	267.069	252.051	415.629	364.201	68.926	153.640	430.106	2738.990
Rest of species	1398.517	3078.058	2970.845	2385.093	3099.935	2818.433	4107.418	2107.089	2368.117	2036.809	5183.053	31553.367
All species total	2281.239	5030.807	5268.309	4422.140	5339.436	4936.778	7496.045	3277.025	3344.479	2763.974	7394.498	51604.730

Table No. 6.0.46.T(B)

CROP COMPOSITION - ALL COMBINED VOL./HA. cu.m. ENTIRE STATE AREA - 11263.90 Km2

Species Name	Diameter classes in cm.										
	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80+	Total
Albizzia lebbek	0.026	0.061	0.060	0.066	0.068	0.052	0.068	0.063	0.024	0.000	0.000	0.488
Albizzia procera	0.010	0.017	0.022	0.036	0.009	0.009	0.030	0.000	0.000	0.000	0.000	0.129
Alnus nepalensis	0.027	0.055	0.033	0.053	0.062	0.054	0.134	0.072	0.065	0.071	0.173	0.799
Bridelia retusa	0.004	0.006	0.012	0.011	0.000	0.008	0.027	0.023	0.071	0.000	0.000	0.162
Callicarpa arborea	0.020	0.026	0.023	0.005	0.000	0.004	0.016	0.000	0.000	0.000	0.000	0.094
Castanopsis hystrix	0.139	0.255	0.316	0.260	0.264	0.209	0.357	0.053	0.062	0.000	0.000	1.945
Castanopsis indica	0.057	0.098	0.093	0.045	0.083	0.042	0.055	0.000	0.000	0.038	0.033	0.544
Dipterocarpus turbinatus	0.007	0.023	0.034	0.040	0.030	0.101	0.221	0.116	0.125	0.118	0.187	1.052
Ficus species	0.036	0.041	0.078	0.049	0.030	0.030	0.150	0.039	0.049	0.038	0.373	0.913
Gmelina arborea Gme	0.009	0.037	0.057	0.039	0.043	0.046	0.112	0.000	0.056	0.000	0.241	0.640
Grewia tiliaefolia	0.021	0.029	0.029	0.032	0.003	0.009	0.000	0.000	0.000	0.000	0.000	0.122
Kydia calycina	0.021	0.046	0.053	0.034	0.039	0.010	0.017	0.000	0.000	[illegible]	0.000	0.220
Lagerstroemia flosreginae	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Macaranga denticulata	0.002	0.001	0.000	0.000	0.000	0.000	0.012	0.000	0.000	0.000	0.057	0.072
Michelia champaca	0.004	0.007	0.005	0.008	0.009	0.016	0.000	0.000	0.000	0.025	0.000	0.074
Pinus khasya/insularis	0.023	0.103	0.225	0.257	0.290	0.262	0.416	0.069	0.014	0.071	0.085	1.825
Quercus serrata	0.021	0.058	0.072	0.059	0.091	0.087	0.167	0.013	0.144	0.025	0.139	0.866
Quercus species	0.274	0.646	0.693	0.632	0.744	0.700	0.859	0.267	0.195	0.123	0.294	5.427
Schima wallichii	0.082	0.197	0.237	0.182	0.237	0.224	0.369	[illegible]	0.161	0.136	0.335	2.430
Rest of species	1.242	2.733	2.637	2.117	2.752	2.502	3.647	1.871	2.102	1.808	4.501	28.017
All species total	2.025	4.459	4.678	3.920	4.784	4.881	6.657	2.709	2.968	2.453	6.565	45.814

CHAPTER VII

INVENTORY RESULTS: BAMBOO GROWING STOCK

7.0 GENERAL:

As described in para 5.14 of Chapter V the total bamboo area of the state is 3691.77 km^2 out of which 2099.84km^2 is as bamboo under storey and 1591.93 km^2 as bambbo brakes. This area is further classified into clump forming and non-clump forming bamboo areas. The area under clump forming bamboos is 1813.64 km^2 (181364 ha.) and that under non-clump forming bamboos is 1876.13 km^2 (187813 ha) total being 3691.77 Km^2.

7.1 DISTRIBUTION OF BAMBOO AREA BY DENSITY & QUALITY:

The area covered under bamboo is classified in density and quality classes as under:

The density of bamboo is decided as under in case of clump forming bamboos:

Density class	Description	
1	Pure bamboo	- 200 or more clumps/ha.
2	Very dense	- 150-200 clumps/ha.
3	Dense	- 100-150 clumps/ha.
4	Moderately dense	- 50-100 clumps/ha.
5	Scattered	- 20- 50 clumps/ha.
6	Sparse	- 1- 20 clumps/ha
7	Bamboo	- Present but completely hacked by people.
8	No bamboo	- Bamboo totally absent.
9	Regeneration crop	- Clump formation not yet taken place.

The density in case of non-clump forming bamboos was estimated on the basis of ocular estimates. The quality of bamboos was decided as under:

Bamboo quality class	Particulars
1	Average culm height 6 meters and more.
2	Average culm height of 4 meters or more but less than 6 meters.
3	Average culm height of 2 meters or more but less than 4 meters.
4	Regeneration crop.

Contents

Table no. 7.1.1T

DISTRIBUTION OF BAMBOO AREA CLUMP FORMING BAMBOOS BY DENSITY AND QUALITY

Density	Quality 1 Area (ha.)	Quality 2 Area (ha.)	Quality 3 Area (ha.)	Quality 4 Regeneration Area (ha.)	5 Total Area (ha.)
1	6448.5	806.1	806.1	-	8060.7
2	8866.7	-		-	8866.7
3	12091.0	-			12091.0
4	28212.2	806.1	806.1	-	29824.4
5	38691.0	-	806.1	-	39497.1
6	38691.0	1612.1	806.1	-	41109.2
7	1612.1	806.1	6448.5	-	8866.7
8	-	-	-	-	-
9 Regeneration	-	-	-	33048.6	33048.6
Total	134612.5	4030.4	9672.9	33048.6	181364.4
%	74.22	2.22	5.33	18.23	100%

Table no.7.1.2T

14825.6

DISTRIBUTION OF BAMBOO AREA NON-CLUMP FORMING BAMBOOS BY DENSITY AND QUALITY

Density	Quality 1 Area (ha.)	Quality 2 Area (ha.)	Quality 3 Area (ha.)	Quality 4 Regeneration Area (ha.)	5 Total Area (ha.)
1	115267.1	5642.4	806.1	-	121715.6
2	16121,2	2418.2	806.1	-	19345.5
3	8866.7	2418.2	-	-	11284.9
4	6448.5	-	806.1	-	7254.6
5	4836.4	806.1	-	-	5642.5
6	4836.4	806.1	-	-	5642.5
7	-	-	-	-	-
8	-	-	-	-	-
9 Regeneration	-	-	-	16927.3	16927.3
Total	156376.3	12091.0	2418.3	16927.3	187812.9
%	83.26	6.44	1.29	9.01	100

170885.6
148315.8
319201.4

7.2 CLUMP FORMING BAMBOO:

The succeeding paragraphs give the details about clump forming bamboo found in Manipur.

7.2.1 NO. OF CLUMPS/HA. BY QUALITY AND SIZE CLASSES: (CLUMP FORMING):

Table no. 7.2.1T given below shows the number of clumps per hectare by quality and size class for clump forming bamboos.

The size class of a clump has been determined on the basis of its diameter. Accordingly bamboo clumps having less than one meter diameter have been categorised into size class one, those having diameter varying from 1 to 2 meters have been classified into size class two and clumps having more than 2 meters diameter are grouped into size class three.

Table no. 7.2.1T

NO. OF CLUMPS/HA. BY QUALITY AND SIZE CLASS (CLUMP FORMING)

Quality	Size class			Total
	1	2	3	
	< 1 mtrs	1-2 mtrs	>2 mtrs	
1	78.383	24.790	7.904	111.077
2	106.000	18.000	-	124.000
3	12.500	5.833	1.667	20.000
Av	65.628	16.208	4.786	85.026

It is clear from the table above that the second quality bamboo having diameter less than one meter contributes maximum to the tune of 106 clumps per ha. The total number of clumps per ha. in this quality is 124.000 clumps per ha. This is followed by occurrence of first quality bamboo contributing total number of 111.077 clumps per ha. and lastly 20.000 clumps per ha. in the third quality class.

7.2.2 MEAN NUMBER OF BAMBOO CULMS PER CLUMP BY QUALITY, SIZE CLASS, AGE AND SOUNDNESS(CLUMP FORMING):

Table no. 7.2.2T produced below gives the mean number of bamboo culms per clump by quality, size class, age and soundness. The table reveals that in the first quality the bamboo stock is maximum, in second clump size class i.e. 20.200 culms per clump. It is followed by first clump size class contributing 6.999 culms per clump. In the rest of the quality classes no culms were available.

Table no. 7.2.2T

MEAN NUMBER OF BAMBOO CULMS/CLUMP BY QUALITY, SIZE CLASS, AGE AND SOUNDNESS(CLUMP FORMING):

Species - Dendrocalamus/strictus/hamiltonii etc.

Quality	Clump size class	Green sound culms						
			One to two season old			Over two seasons old		
		Current year	2<5 cm	5<8 cm	>8 cm	2<5 cm	5<8 cm	>8 cm
1	1	1.071	1.500	0.071	-	1.893	0.429	-
	2	2.100	1.900	0.100	-	10.500	1.700	-
	3	-	-	-	-	-	-	-
Total		3.171	3.400	0.171	-	12.393	2.129	-

Table no. 7.2.2T(contd)

Quality	Clump size class	Green damaged culms						
			One to two season old			Over two seasons old		
		Current year	2<5 cm	5<8 cm	>8 cm	2<5 cm	5<8 cm	>8 cm
1	1	0.143	0.321	-	-	0.250	-	-
	2	-	0.400	-	-	0.100	0.100	-
	3	-	-	-	-	-	-	-
Total		0.143	0.721	-	-	0.350	0.100	-

Contents

Table no. 7.2.2T(contd)

Quality	Culm size class	Dry sound culms 2<5 cm	5<8 cm	>8 cm	Dry damaged culms 2<5 cm	5<8 cm	>8 cm	Decayed culms	Total no. of culms.
	1	0.857	-	-	0.464	-	-	-	6.999
1	2	0.300	0.300	0.300	1.800	-	-	0.600	20.200
	3	-	-	-	-	-	-	-	-
Total		1.157	0.300	0.300	2.264	-	-	0.600	27.199

It is pertinent to note that bamboo yield is available in all the diameter classes viz. 2<5, 5<8 and more than 8 cm diameter. Dry sound culms are also available in all the three classes.

7.2.3. <u>MEAN NUMBER OF BAMBOO CULMS PER CLUMP BY AGE: (CLUMP FORMING)</u>:

Table no. 7.2.3.T produced below gives the distribution of culms per clump by age. It is seen from the table that in the first quality bamboo, 14.972 culms are over two seasons old out of total 27.199 culms.

Table no. 7.2.3T

<u>MEAN NUMBER OF BAMBOO CULMS/CLUMP BY AGE (CLUMP FORMING)</u>

<u>Species: Dendrocalamus strictus/hamiltonii etc.</u>

Quality	Clump size class	Current year	One to two season old	Over two seasons old	Dry sound	Dry damaged	Decayed	Total
1	2	3	4	5	6	7	8	9
	1	1.214	1.892	2.572	0.857	0.464	-	6.999
1	2	2.100	2.400	12.400	0.900	1.800	0.600	20.200
	3	-	-	-	-	-	-	-
Total		3.314	4.292	14.972	1.757	2.264	0.600	27.199

Contents

7.2.4 MEAN NUMBER OF BAMBOO CULMS PER CLUMP BY SOUNDNESS (CLUMP FORMING):

Table no. 7.2.4T produced below gives the distribution of bamboo culms per clump by soundness. It is clear from the table that maximum of 16.300 culms per clump are from green sound crop in second clump size class. Next followed is dry damaged culms of 1.800 culms per clump. Decayed culms were also found in this clump size class amounting to 0.600 culms per clump.

Table no. 7.2.4T

MEAN NUMBER OF BAMBOO CULMS/CLUMP BY SOUNDNESS(CLUMP FORMING):

Species: *Dendrocalamus strictus/hamiltonii etc.*

Quality	Clump size class	Green sound	Green damaged	Dry sound	Dry damaged	Decayed	Total
	1	4.964	0.714	0.857	0.464	-	6.999
1	2	16.300	0.600	0.900	1.800	0.600	20.200
	3	-	-	-	-	-	-
	Total	21.264	1.314	1.757	2.264	0.600	27.199

7.2.5 MEAN NUMBER OF BAMBOO CULMS/HA. BY AGE: (CLUMP FORMING):

Table no.7.2.5T produced below displays the yield of bamboo culms per ha. by age. It is revealed from the table that matured culms of over two seasons give the maximum yield of 509.0 culms per ha. followed by 207.8 culms per ha. in one to two seasons old class. Next is the yield of 147.3 culms per ha. in current year, thereafter dry sound 89.5 culms/ha., dry damaged 81.0 culms and lastly 14.9 decayed culms per ha.

Contents

Table no. 7.2.5T

MEAN NUMBER OF BAMBOO CULMS/HA. BY AGE(CLUMP FORMING).

Species: *Dendrocalamus strictus/hamiltonii* etc.

Quality	Clump size class	Current year	One to two season old	Over two seasons old	Dry sound	Dry damaged	Decayed	Total
	2	3	4	5	6	7	8	9
	1	95.2	148.3	201.6	67.2	36.4	-	548.7
	2	52.1	59.5	307.4	22.3	44.6	14.9	500.8
	3	-	-	-	-	-	-	-
Total		147.3	207.8	509.0	89.5	81.0	14.9	1049.5

7.2.6 **MEAN NUMBER OF BAMBOO CULMS PER HECTARE BY SOUNDNESS (CLUMP FORMING):**

Table no. 7.2.6T produced below shows the distribution of culms per ha. by soundness in various clump size classes in bamboos of various qualities.

Table no. 7.2.6T

MEAN NUMBER OF BAMBOO CULMS/HA BY SOUNDNESS(CLUMP FORMING)

Species: *Dendrocalamus strictus/hamiltonii* etc.

Quality	Clump size class	Green sound	Green damaged	Dry sound	Dry damaged	Decayed	Total
	1	389.1	56.0	67.2	36.4	-	548.7
1	2	404.1	14.9	22.3	44.6	14.9	500.8
	3	-	-	-	-	-	-
Total		793.2	70.9	89.5	81.0	14.9	1049.5

It is seen from the above table that total number of culms per ha. bamboo is 1049.5 culms distributed as 793.2 green sound culms, 70.9 green damaged culms, 89.5 dry sound, 81.0 dry damaged and 14.9 decayed culms. Total availability of culms per ha. in first quality and first size class is 548.7 culms followed by 500.8 culms in first quality and second clump size class.

Contents

7.2.7 TOTAL NUMBER OF BAMBOO CULMS (000) BY AGE: (CLUMP FORMING):

Table no. 7.2.7T displays the distribution of bamboo yield by age classes. The table reveals the fact that matured culms contribute maximum number i.e 68517800 culms constituting 48.5% of total bamboo stock. Next comes from one to two seasons old culms numbering to 27972400 culms constituting 19.80% of total bamboo stock. Current years recruitment of culms is 19828400 constituting 14.03%, dry sound culms number is 12047800 constituting 8.53%, dry damaged culms are 10903600 constituting 7.72% and decayed culms are 2005700 constituting 1.42% only.

Table no. 7.2.7T

TOTAL NUMBER OF BAMBOO CULMS(000)BY AGE(CLUMP FORMING):

Species: Dendrocalamus strictus/hamiltonii etc.

Quality	Clump size class	Current year	One to two season old	Over two seasons old	Dry sound	Dry damaged	Decayed	Total
1	2	3	4	5	6	7	8	9
	1	12815.1	19963.0	27137.9	9046.0	4899.9	-	73861.9
1	2	7013.3	8009.4	41379.9	3001.8	6003.7	2005.7	67413.8
	3	-	-	-	-	-	-	-
Total		19828.4	27972.4	68517.8	12047.8	10903.6	2005.7	141275.7
%		14.03	19.80	48.50	8.53	7.72	1.42	100

7.2.8 TOTAL NUMBER OF BAMBOO CULMS (000) BY SOUNDNESS: (CLUMP FORMING):

Table no. 7.2.8T produced below gives the availability of total number of bamboo culms by their soundness in Manipur state. The table shows that in Manipur 141257700 culms are estimated with their distribution as 106774600 culms green sound, 9544000 culms green damaged, 12047800 culms dry sound, 10903600 culms dry damaged and 2005700 culms decayed. The green sound culms constitute 75.58%, green damaged culms 6.76%, dry sound culms 8.52% dry damaged 7.72% and decayed culms 1.42%.

Contents

Table no. 7.2.8T

TOTAL NUMBER OF BAMBOO CULMS(000) BY SOUNDNESS(CLUMP FORMING)

Species: *Dendrocalamus strictus/hamiltonii* etc.

Quality	Clump size class	Green sound	Green damaged	Dry sound	Dry damaged	Decayed	Total
	1	52377.7	7538.3	9046.0	4899.9	-	73861.9
1	2	54396.9	2005.7	3001.8	6003.7	2005.7	67413.8
	3	-	-	-	-	-	-
Total		106774.6	9544.0	12047.8	10903.6	2005.7	141275.7
%		75.58	6.76	8.52	7.72	1.42	100

From the above table it is evident that maximum number of culms viz. 73861900 is available from first clump size class having first quality bamboo. The distribution of this number of bamboo culms in various soundness classes is 52377700 culms green sound, 7538300 culms green damaged, 9046000 culms dry sound and 4899900 culms dry damaged. No decayed culms are found in this category. A considerable number of bamboo culms are available in second clump size class with its distribution as 54396900 culms green sound, 2005700 culms green damaged, 3001800 culms dry sound, 6003700 culms dry damaged and 2005700 decayed culms having no utility. Total number of culms in second clump size class are 67413800.

7.2.9 BAMBOO WEIGHT:

The bamboo weight was arrived at on the basis of weighment of bamboo samples collected and dried. It is given in the table below.

Table No. 7.2.9T

BAMBO WEIGHT (CLUMP FORMING)

Name of species	2 cm < 5cms size			5 to 8 cms size			8 cms and above size		
	No. of culms	Green weight in kgs.	Average weight in kgs.	No. of culms	Green weight in kgs.	Average weight in kgs.	No. of culms	Green weight in kgs	Average weight in kgs.
Dendrocalamus strictus/ hamiltonii etc.	238	1038.070	4.362	101	1266.700	12.541	21	742.810	35.372
Air dry weight factor	-	62.03%	-	-	50.34%	-	-	40.77%	-
Air dry weight per culm	-	-	2.705	-	-	5.313		-	14.421

* Average air dry weight of bamboo culm (clump forming) is 7.813 kg.

7.2.10. <u>GREEN BAMBOO STOCK (IN 000 TONNES) BY AGE AND SOUNDNESS(CLUMP FORMING)</u>:

On the basis of data collected during the survey the bamboo stock in (000) tonnes by age and soundness in different quality classes and clump size classes is worked out and given in table no. 7.2.10T. The total green bamboo stock in Manipur is worked out to be 811284 tonnes out of which 388290 tonnes are of first clump size class and 422994 tonnes in second clump size class.

Table no. 7.2.10T

<u>GREEN BAMBOO STOCK IN THOUSAND TONNES BY AGE AND SOUNDNESS(CLUMP FORMING)</u>:

Species - Dendrocalamus strictus/hamiltonii etc.

Quality	Clump size class	Green sound culms						
		One to two season old				Over two seasons old		
		Current year	2<5 cm	5<8 cm	>8 cm	2<5 cm	5<8 cm	>8 cm
	1	49.293	69.037	9.395	-	87.125	56.767	-
1	2	30.568	27.657	4.185	-	152.840	71.145	-
	3	-	-	-	-	-	-	-
Total		79.861	96.694	13.580	-	239.965	127.912	-

Table No.7.2.10T (contd.)

Quality	Clump size class	Green damaged culms						
		One to two season old				Over two seasons old		
		Current year	2<5 cm	5<8 cm	>8 cm	2<5 cm	5<8 cm	>8 cm
	1	3.291	7.387	-	-	5.753	-	-
1	2	-	2.911	-	-	0.728	2.092	-
	3	-	-	-	-	-	-	-
Total		3.291	10.298	-	-	6.481	2.092	-

Contents

Table No.7.2.10T(contd.)

Quality	Culm size class	Dry sound culms 2<5 cm	5<8 cm	>8 cm	Dry damaged culms 2<5 cm	5<8 cm	>8 cm	Decayed culms	Total
	1	78.887	-	-	21.355	-	-	-	388.290
1	2	8.734	25.110	70.823	26.201	-	-	-	422.994
	3	-	-	-	-	-	-	-	-
Total		87.621	25.110	70.823	47.556	-	-	-	811.284

7.3. NON-CLUMP FORMING BAMBOO:

The details about non-clump formimg bamboo are given below.

7.3.1 DISTRIBUTION OF AREA AND PLOTS BY DENSITY AND QUALITY (NON-CLUMP FORMING):

Table no. 7.1.2T of this chapter gives the distribution of bamboo area by density and quality for occurrence of non-clump forming bamboo in Manipur state. Non-clump forming bamboo found in Manipur is mainly Melocanna bambusoides or Muli bamboo. The total area under this crop including area covered by regeneration crop is 1878.13 km^2 (187812.9 ha.). The regeneration crop is confined to 16927.3 ha. constituting 9.01% of the total area. Out of the total area of 156376.3 ha. is under first quality muli bamboo constituting 83.26% of total area under bamboo forest, 12091 ha is under second quality muli bamboo which is 6.44% and 2418.3 ha is covered under third quality muli bamboo constituting 1.29% only.

From the table, it is also seen that the bamboo density one i.e. the areas bearing bamboo culms exceeding 200 number per ha., contributes 121715.6 ha. or 64.8% of the total area. Second density class bamboo areas constitute 10.3%, third density class constitutes 6.01%, fourth constitute 3.86%, fifth and sixth constitute 3.01% each.

7.3.2 BAMBOO CULMS PER HECTARE BY AGE AND SOUNDNESS: (NON CLUMP FORMING):

Table no. 7.3.2T produced below displays the distribution of muli bamboo culms per hectare by age and soundness. All culms are in size class one totalling 15476.240 culms per ha. out of which 13104.159 culms are green sound, 1135.473 culms are green damaged, 367.552 culms are dry sound, 567.920 culms are dry damaged and 301.136 culms are decayed.

Contents

Table no. 7.3.2T

BAMBOO CULMS PER HA. BY AGE AND SOUNDNESS (NON-CLUMP FORMING):

Species - Muli bamboo (Melocanna bambusoides)

Green sound						
	One to two seasons old			Over two seasons old		
Current year	2<5cm	5<8cm	8+cm	2<5cm	5<8cm	8+cm
4659.248	3815.095	272.456	-	4026.416	330.944	-

Table no. 7.3.2T(contd.)

Green damaged						
	One to two seasons old			Over two seasons old		
Current year	2<5cm	5<8cm	8+cm	2<5cm	5<8cm	8+cm
318.112	396.224	21.512	-	376.984	22.641	-

Table no. 7.3.2T(contd.)

Dry sound			Dry damaged			Decayed culms	Total
2<5cm	5<8cm	8+cm	2<5cm	5<8cm	8+cm		
339.248	28.304	-	529.432	38.488	-	301.136	15476.240

The above table reveals that 4977.360 culms per hectare are attributed to current year's recruitment. One to two seasons old culms are 4087.551 green sound and 417.736 green damaged. Mature or over two seasons old culms per ha. are 4357.360 green sound and 399.625 green damaged.

7.3.3. **TOTAL NUMBER OF BAMBOO CULMS BY AGE AND SOUNDNESS IN '000'(NON CLUMP FORMING):**

Table no. 7.3.3T produced below provides total number of bamboo culms of muli bamboo expressed in '000' distributed by age and soundness. It is seen from the table that 2644666500 number of bamboo culms are in stock out of

Contents

which 2239312100 are green sound, 194036000 are green damaged, 62809300 are dry sound, 97049300 are dry damaged and 51549800 are decayed culms.

Table no. 7.3.3.T

TOTAL NUMBER OF BAMBOO CULMS BY AGE AND SOUNDNESS '000' (NON-CLUMP FORMING)

Species - Muli bamboo (Melocanna bambusoides)

Green sound						
	One to two seasons old			Over two seasons old		
Current year	2<5cm	5<8cm	8+cm	2<5cm	5<8cm	8+cm
796198.4	651944.8	46558.8	-	688056.5	56553.6	-

Table no. 7.3.3T(contd.)

Green damaged						
	One to two seasons old			Over two seasons old		
Current year	2<5cm	5<8cm	8+cm	2<5cm	5<8cm	8+cm
54360.8	67709.0	3676.1	-	64421.1	3869.0	-

Table no.7.3.3T(contd.)

Dry sound			Dry damaged			Decayed culms	Total
2<5cm	5<8cm	8+cm	2<5cm	5<8cm	8+cm		
57972.6	4836.7	-	90472.3	6577.0	-	51549.8	2644666.5

It is seen from the table that the green sound culms existing in the area are 2239312100 constituting 84.67% of total available yield. Green damaged culms found were 194036000 constituting 7.34%. The availability of current year culms is 850559200 constituting 32.16% that of one to two seasons old culms is 769888700 constituting 29.11% and that of mature culms is 812900200 constituting 30.74%, the rest are dry sound, dry damaged and decayed culms.

Contents

7.3.4 BAMBOO WEIGHT(NON-CLUMP FORMING):

The bamboo weight was arrived on the basis of weighment and drying of bamboo samples. Table no. 7.3.4T given below expresses the green weight per culm of muli bamboo under different dia. classes. The average green weight of muli bamboo in 2<5 cm culm diameter class comes to be 3.913 kg and that of 5<8 cms. dia. culm , it is 9.158 kg. The dry weight per culm under dia.class 2<5 works out to be 2.497 kg. and for 5 to <8 cm. diameter, it works out to be 5.294 kg.

Table No. 7.3.4T

BAMBOO WEIGHT NON - CLUMP FORMING

Name of species	Code	2 cm to <5 cms			5 cms to <8cms		
		Dry wt. factor	Average green weight in kg.	Average dry wt. in kg.	Dry wt. factor	Average green wt. in kg	Average dry wt. in kg.
Malocana bombusoides	941	63.82%	3.913	2.497	57.83%	9.158	5.294

The average air dry weight of bamboo 3.8955 kg.

7.3.5 TOTAL BAMBOO STOCK IN '000' TONNES (NON-CLUMP FORMING):

On the basis of data collected during the survey the details of bamboo stock in '000' tonnes of muli bamboo is given in below table no. 7.3.5.T. The table shows 10659200 tonnes of muli bamboo stock is available in Manipur. Out of this stock green sound bamboos are 9303300 tonnes green damaged are 399400 tonnes, dry sound are 542300 tonnes, dry damaged are 414200 tonnes. No decayed culms were observed in muli bamboo.

Contents

Table no. 7.3.5T

GREEN BAMBOO STOCK IN(000) TONNES BY AGE AND SOUNDNESS (NON-CLUMP FORMING)

Species - Muli bamboo (Melocanna bambusoides)

	Green sound					
	One to two seasons old			Over two seasons old		
Current year	2<5cm	5<8cm	8+cm	2<5cm	5<8cm	8+cm
3115.5	2551.1	426.4	-	2692.4	517.9	-

Table no. 7.3.5T(contd.)

	Green damaged					
	One to two seasons old			Over two seasons old		
Current year	2<5cm	5<8cm	8+cm	2<5cm	5<8cm	8+cm
106.4	132.5	16.8	-	126.0	17.7	-

Table no.7.3.5T(contd.)

Dry sound			Dry damaged			Decayed culms	Total
2<5cm	5<8cm	8+cm	2<5cm	5<8cm	8+cm		
453.7	88.6	-	354.0	60.2	-	-	10659.2

The table further reveals that current years yield of muli bamboo is 3221900 tonnes and that of one to two seasons old bamboo is 3126800 tonnes and over two seasons old or mature bamboo is 3354000 tonnes.

7.4 COMBINED BAMBOO STOCK (IN THOUSANDS TONNES) OF CLUMP FORMING AND NON-CLUMP FORMING BAMBOOS:

On the basis of earlier paras of this chapter the total bamboo stock in thousand tonnes in Manipur state is tabulated below in table no. 7.4T.

Contents

Table No. 7.4T

COMBINED BAMBOO STOCK IN THOUSAND TONNES

S.No.	Class	Clump forming bamboo	Non-clump bamboo	Total	%
1.	Green sound current year	79.861	3115.500	3195.361	27.86
2.	Green sound one to two seasons old	110.274	2977.500	3087.774	26.92
3.	Green sound over two seasons old	367.877	3210.300	3578.177	31.19
4.	Green damaged current year	3.291	106.400	109.691	0.96
5.	Green damaged one to two seasons old	10.298	149.300	159.598	1.39
6.	Green damaged over two seasons old	8.573	143.700	152.273	1.33
7.	Dry sound	183.554	542.300	725.854	6.33
8.	Dry damaged	47.556	414.200	461.756	4.02
9.	Decayed	-	-	-	
10.	Total	811.284	10659.200	11470.484	100

The above tabulation indicates that the total bamboo stock in the state is 11470 484 m. tonnes. The recruitment of current year bamboos is 27.86% which is very satisfactory. While harvesting annual yield from bamboo coupes attempts need to be made to remove green damaged, dry damaged, dry sound and dry damaged stock so as to improve the crop conditions.

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CHAPTER - VIII

WOOD CONSUMPTION STUDY IN MANIPUR STATE

8.0 GENERAL:

Along with the inventory survey in the year 1988 some data on annual consumption of wood for domestic purposes in Manipur State was also collected and compiled. Apart from the data regarding annual consumption of wood for construction and fuel purposes the data regarding other substitutes for wood and fuel such as agricultural waste, bamboos, thatch grass and other miscellaneous waste products was also gathered during the survey.

8.0.1 The entire rural population of Manipur is residing in the habitat covered with the forests and as such the rural areas in forest vicinity was one of the major stratum in the survey. The other areas are urban areas comprising of small and big towns which are a little away from the forests and have different pattern of living than the rural areas and as such the urban areas were the second stratum of this survey.

8.1 OBJECTIVES OF THE STUDY:

The study was organised as a supplement to the inventory survey carried out in this state during the year 1988 with the objective that it should provide the information regarding annual consumption of wood for domestic purposes in rural and urban areas. It is also aimed in this study to estimate the annual consumption of other substitutes for timber and fuel such as agricultural waste, bamboo, thatch grass and other miscellaneous waste products.

8.2 BASIC INFORMATION ADOPTED FOR THE STUDY:

The following basic information was adopted for compiling the results of this study. This was collected from the Statistical Handbook of Manipur published in the year 1985. The population figures and other data is based on the 1981 Census results.

1) Total number of inhabited villages in the state	-	2,035
2) Total number of towns in the state	-	32
3) Total population	-	14,20,953
4) Total rural population	-	10,45,493
5) Total urban population	-	3,75,460

Contents

6) Total number of rural households - 171502

7) Total number of urban households - 59621

8) Average size of rural households(persons) - 6.09

9) Average size of urban households(persons) - 6.29

10) Numbers of forest based industries(Saw mills) - 118

8.3 <u>INCOME GROUPS</u>:

The following income groups were identified in rural and urban areas for the purpose of this study.

1) Low income group - Annual income per household is less than Rs.3600/-.

2) Middle income group - Annual income per household is between Rs.3600- 7000/-.

3) Upper income group - Annual income per household is Rs. 7000/- and more.

8.4 <u>METHODOLOGY ADOPTED FOR STUDY</u>:

The following methodology was adopted during the study.

8.4.1 <u>STRATIFICATION OF HABITATIONS</u>:

The villages and towns were treated as separate strata thus the villages were grouped under stratum 'Rural areas' and the towns under 'Urban areas'.

8.4.2 <u>SELECTION OF VILLAGES AND TOWNS FOR STUDY</u>:

The villages and towns visited during the course of inventory were treated as sample units for conducting wood consumption studies. These units are spread all over the survey area and are representative of the area.

8.4.3 <u>FORMS USED FOR DATA COLLECTION</u>:

The survey parties were provided with the following forms for data collection along with the instructions for filling these forms:

1) General data collection form.

2) Form I - Wood consumption for house construction.

3) Form II - Wood consumption for existing furniture items.

4) Form III - Wood consumption for agricultural implements.

5) Form IV - Fuel wood consumption.

6) Form V - Other produce used in the households.

The quantum of wood used was measured and also worked out by using various conversion factors.

8.4.4 NUMBER OF VILLAGES, TOWNS, HOUSEHOLDS SURVEYED:

The following statement gives the details of villages/towns, households and family members visited during the study.

RURAL AREA

S.No.	Name of village	No.of sample households	No. of family members
1.	Khebusing	6	38
2.	Muallum	10	84
3.	Utlaou	6	42
4.	Partsangham	6	41
5.	Singatte	6	57
6.	Mualtam	6	54
7.	Nagaching	6	41
8.	Tengnopal	10	69
9.	Bualkot	6	39
10.	Sialsi	6	49
11.	Theigotong	6	50
12.	Chiyangpi	6	49
13.	Chongehing	6	41
14.	Thonglon	6	38
15.	Thinken	6	40
16.	Tuilphai	6	29
17.	Kekranaga	10	62
18.	Tonglon	3	20
19.	Behang valley	3	16
20.	Khanggin	3	28
21.	Yangnon	6	34
22.	Aige	6	39
23.	Naganpabung	6	47
24.	Parabung	5	46
25.	Pherzol	6	46

Contents

26.	Senvan	6	38
27.	Lungthulia	6	44
28.	Parvachwam	6	46
29.	Serou	6	32
30.	Singtom	6	32
31.	Khullen	6	40
32.	Kathang	6	50
33.	Haika	6	46
34.	Sugnu	6	48
35.	Khanghang paisaba	5	36
36.	Utang pokpi	6	35
37.	Khugjang	6	41
38.	Phoikon	6	31
39.	Sagika Tampak	7	46
40.	Paldai	5	27
41.	Tuitum	6	47
42.	Hita village	6	33
43.	Kanjuigang	5	25
44.	Leishan	6	68
45.	Hauship	6	57
46.	Bukpi	6	54
47.	Humgkong	6	38
48.	Phaibung khullen	6	38
49.	Nambsai khullen	3	24
50.	Changta	5	34
51.	Saikul	1	7
Total		297	2116

URBAN AREAS

S.No.	Name of town	No. of sample households	No. of family members
1.	Moreh	10	65
2.	Moirang	6	39
3.	Chandel	10	67
4.	Imphal	20	177
5.	Churachandpur	20	137
6.	Tamenglong	10	61
7.	Bishnupur	6	53
Total		82	599

8.4.5 DATA COLLECTION:

The crew leaders visited these villages, towns, households and persons therein and collected the data on domestic consumption of wood and other produce in them by personally enquiring with the dwellers. The data so collected was filled in the forms prescribed for the purpose.

All the field forms duly filled were checked and consumption of wood and other forest produce under different items was calculated. The figures so arrived at were processed on personal computer for compiling the quantum of annual consumption of wood for construction of houses, manufacture of furniture, manufacture of agricultural implements, consumption of fuel, charcoal, agricultural waste, thatch grass, bamboo, other miscellaneous waste etc.

8.5 FINDINGS OF THE STUDY:

The findings of the study are compiled as under:

8.5.1 GENERAL INFORMATION (PER HOUSEHOLD)

S.No.	Particulars	Income group			Irrespective of income
		Low	Middle	Upper	
		RURAL AREAS			
1.	Av. house plinth area in m^2 per household	55.215	85.712	100.723	79.120
2.	No.of family members per household(unit)	6.02	7.10	8.49	7.12
3.	Annual income of household (in Rs.)	2906	5472	11769	6426
		URBAN AREAS			
1.	Av. house plinth area in m^2 per household	72.714	90.393	101.961	88.024
2.	No.of family members per household(unit)	7.14	7.29	7.50	7.30
3.	Annual income of household (in Rs.)	3446	6021	13334	7461

Contents

8.5.2 CONSUMPTION OF WOOD AND OTHER PRODUCE(PER HOUSEHOLD)

S.No.	Particulars	Income group			Irrespective of income
		Low	Middle	Upper	
		RURAL AREAS			
1.	Consumption of misc. timber for construction of houses (in cubic meters)	2.972	5.164	6.987	4.913
2.	Consumption of misc. timber for manufacture of furniture(in cubic meters)	0.385	0.669	0.784	0.600
3.	Consumption of misc. timber for repairs to agricultural implements(in cubic meters)	0.074	0.083	0.168	0.105
4.	Consumption of fuel(in kg.)	541.444	723.460	887.461	706.417
5.	Consumption of charcoal(in kg.)	0.741	1.000	1.292	0.993
6.	Consumption of bamboo(in kg.)	820.037	1028.700	933.112	924.178
7.	Consumption of thatch grass (in kg.)	416.528	861.600	658.595	638.922
8.	Consumption of agricultural waste(in kg.)	1.019	1.100	1.685	1.245
9.	Consumption of other misc.waste (in kg.)	28.241	156.650	70.787	84.225

Contents

The above statement shows that the per household consumption of miscellaneous timber for construction of houses, manufacture of furniture, repairs to agricultural implements, fuelwood and charcoal consumption increases with the rise in annual income of the family. In case of consumption of bamboo, thatch grass and other miscellaneous waste, it is higher in middle income group. The rate of utilization of agricultural waste rises with rise in income.

S.No.	Particulars	Income group			Irrespective of income
		Low	Middle	Upper	
	URBAN AREAS				
1.	Consumption of misc. timber for construction of houses (in cubic meters)	2.260	3.816	5.024	3.668
2.	Consumption of misc. timber for manufacture of furniture(in cubic meters)	0.869	1.146	1.495	1.162
3.	Consumption of misc. timber for repairs to agricultural implements(in cubic meters)	0.006	0.070	0.011	0.030
4.	Consumption of fuel(in kg.)	161.250	220.714	243.846	207.744
5.	Consumption of charcoal(in kg.)	8.571	15.142	18.846	14.073
6.	Consumption of bamboo(in kg.)	307.679	311.071	222.115	281.707
7.	Consumption of thatch grass (in kg.)	260.714	238.571	186.154	229.512
8.	Consumption of agricultural waste(in kg.)	1.786	3.929	0.385	2.073
9.	Consumption of other misc.waste (in kg.)				

Contents

In case of urban areas the rate of consumption of miscellaneous timber for construction of houses, manufacture of furniture, consumption of fuel and charcoal increase with the rise in income. The trend in case of consumption of miscellaneous timber for repairs to agricultural implements, utilization of bamboo and agricultural waste is higher in middle income group. In case of consumption of thatch grass the rate is highest in low income group and lowest in high income group. These variations are due to varying standards of living and availability of the produce.

8.6 COMPARISON IN RATE OF CONSUMPTION IN RURAL AND URBAN AREAS:

The rate of consumption of miscellaneous timber per household for the construction of houses is 4.913 cubic meter in Rural areas while in Urban areas it is 3.668 cubic meter. This is due to the use of bricks, steel, cement, and other materials in constructions in Urban areas. The utilization of miscellaneous timber for making furniture is higher in Urban areas due to their different pattern of living. The requirement of miscellaneous timber for repairs to agricultural implements is less in Urban areas since the Urban population is engaged in non-agricultural occupations. The consumption of fuel is less in urban areas due to the use of alternatives viz. electricity, gas, kerosene etc. for fuel. The rate of consumption of charcoal is nearly 15 times that of rural areas in urban areas which is due to popularity of charcoal in urban areas. The consumption of bamboos and thatch grass is low in urban areas mostly due to use of bricks, tiles, tin sheets and asbestos sheets for similar purposes in urban areas. The rate of consumption of agricultural waste is higher in urban areas mostly due to the use of straw and cowdung cakes for burning. The utilization of other miscellaneous waste was not noticed in urban areas.

8.7 ESTIMATE OF TOTAL ANNUAL CONSUMPTION OF WOOD AND OTHER PRODUCE PER PERSON AND FOR ENTIRE STATE:

Based on the rate of annual consumption of wood and other produce per household and considering the total number of households the total consumption in the state is estimated as under:

Contents

S.No.	Particulars	Total consumption		
		Rural	Urban	Total
1.	Consumption of misc. timber for construction of houses (in cubic meters)	842589	218689	1061278
2.	Consumption of misc. timber for manufacture of furniture(in cubic meters)	102901	69279	172180
3.	Consumption of misc. timber for repairs to agricultural implements(in cubic meters)	18007	1788	19795
4.	Consumption of fuel(in kg.) (or in 000 M.T.)	121151928 (121.152)	12385905 (12.386)	133537833 (133.538)
5.	Consumption of charcoal(in kg.) (or in 000 M.T.)	170301 (0.170)	839046 (0.839)	1009347 (1.009)
6.	Consumption of bamboo(in kg.) (or in 000 M.T.)	158498375 (158.498)	16795653 (16.796)	175294028 (175.294)
7.	Consumption of thatch grass (in kg.) (in 000 M.T.)	109576400 (109.576)	13683734 (13.684)	123260134 (123.260)
8.	Consumption of agricultural waste(in kg.) (in 000 M.T.)	213519 (0.213)	123594 (0.124)	337113 (0.337)
9.	Consumption of other misc.waste (in kg.) (in 000 M.T.)	14444755 (14.445)	-	14444755 (14.445)

Contents

In the above statement the consumption of miscellaneous timber at Sr. No. 1,2 & 3 i.e for construction of house, manufacture of furniture and repairs to agricultural implements gives the total quantum in use in the state at the time of survey. In order to know the annual consumption of miscellaneous timber for such works the trend in rise in population during the previous ten census years is considered as a basis. As per the census record the population of Manipur state has increased from 1072753 persons during the year 1971 to 1420953 persons during the year 1981. Adopting the same trend of rise the annual consumption of miscellaneous timber is calculated in the below statement.

As regards the Sr.Nos. 4 to 9 i.e. fuelwood, charcoal, bamboo, thatch grass, agricultural waste and other miscellaneous waste the data obtained is for the annual consumption as such the same is adopted for arriving at annual consumption per person.

ANNUAL CONSUMPTION

Sr. No.	Particulars	Annual consumption of various items					
		Total			Per person		
		Rural	Urban	Total	Rural	Urban	Total
1.	Consump- of misc. timber for construction of houses (in cubic meters)	27349	7098	34447	0.026	0.019	0.024
2.	Consumption of misc. timber for manufacture of furniture (in cubic meters)	3340	2249	5589	0.003	0.006	0.004

Contents

3. Consumption of misc. timber for repairs to agricultural implements(in cu.mtrs.)	584	58	642	0.0006	0.0002	0.0005
4. Consumption of fuel(in kg. or in 000 M.T.)	121151928 (121.152)	12385905 (12.386)	133537833 (133.538)	115.880 (-)	32.989 (-)	93.978 (-)
5. Consumption of charcoal(in kg. or in 000 M.T.)	170301 (0.170)	839046 (0.839)	1009347 (1.009)	0.163 (-)	2.235 (-)	0.710 (-)
6. Consumption of bamboo (in kg. or in 000 M.T.	158498375 (158.498)	16795653 (16.796)	175294028 (175.294)	151.602 (-)	44.734 (-)	123.364 (-)
7 Consump- of thatch grass (in kg. or in 000 M M.T.)	109576400 (109.576)	13683734 (13.684)	123260134 (123.260)	104.808 (-)	36.445 (-)	86.745 (-)
8. Consumption of agricul-waste (in kg.or in 000 M.T.)	213519 (0.213)	123594 (0.124)	337113 (0.337)	0.204 (-)	0.329 (-)	0.237 (-)
9. Consump- of other misc.waste (in kg.) (or in 000 M.T.)	14444755 (14.445)	-	14444755 (14.445)	13.816 (-)	-	10.166 (-)

Contents

The above estimates are based on samples collected during the year 1988 and the population figures as in the year 1981. They are broad estimates and be used as indicative of general trend of consumption.

8.8 FUTURE PROJECTIONS:

The rate of consumption of various commodities for various purposes is bound to change considerably in future with the rise in population. This rate will also alter in future in Rural and Urban areas due to restrictions on felling of trees and use of substitutes like iron, steel, aluminium, plastic, fibre glass and synthetic materials for timber and alternative sources of energy like solar heat, biogas, petroleum gas, kerosene, electricity etc.

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